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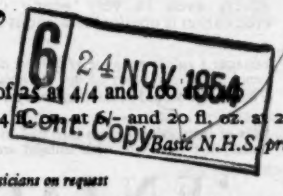

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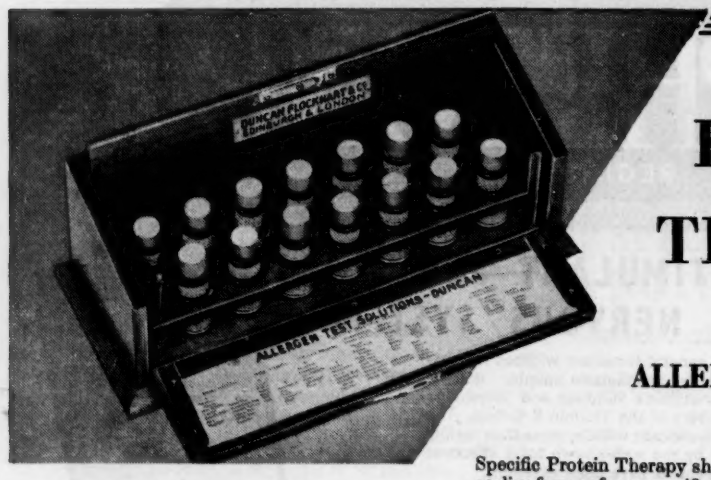

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the antispasmodic antacid

Powder
Containers of 100 Gm.
Basic N.H.S. Rate 3/3

Tablets
Box of 60 (5 packets of 12)
Basic N.H.S. Rate 3/-

British Schering Limited, Kensington High Street, London, W.8 telephone: WEStern 8111

TOLSERAM

MEPHENESIN CARBAMATE

The new SQUIBB product

for the treatment of–

***MUSCLE SPASM (including fibrositis)**

***CERTAIN NEUROLOGICAL DISORDERS**

Literature gladly sent on request.

SQUIBB

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7

*A Rubefacient Balm with an important difference **

Cremalgin

(for treatment of rheumatism, fibrositis and allied complaints)

On average 100,000 prescriptions for rubefacient balms are written *monthly* — testimony enough to their efficacy. But the cost to the Health Service is disturbing, particularly in the light of the urgent need for economy. What then is the solution? The answer can be found in Cremalgin, a rubefacient cream identical in formula and quality, **yet 50% less costly than the best methyl nicotinate creams currently prescribed.* This vital contribution to N.H.S. economy is made possible by the issue of dispensing *packs* and by realistic costing and production methods. That the need for such an economy is foremost in the minds of the medical profession is clearly shown by the fact that no fewer than 4,000 doctors have already received samples of Cremalgin *at their own request.*

Methyl Nicotinate 1.0%. *Glycol Salicylate* 10.0%. *Histamine Dihydrochloride* 0.1%. *Capsicin* 0.1%. *Excipient q.s.*

Wholesale chemists can now supply Cremalgin in 1 oz. dispensing tubes at 21/- per doz. and in 1 lb. dispensing jars at 19/6 per unit.

West Pharmaceutical Company

Wood Lane, London, W. 12. Telephone SHEpherds Bush 6262

Lifelessness

APATHY or lifelessness are symptoms commonly observed in debility states, but despite clinical tests, the cause often remains obscure. These are the circumstances in which the possibility of conditioned B-avitaminosis may be considered.

A preparation containing all the elements of the B-Complex as present in yeast extract, 'BEPLEX' will speedily resolve doubts on the vitamin aetiology of symptoms, and restore any deficiencies that have arisen.

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'Beplex'
Trade Mark
ELIXIR and CAPSULES

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Hewlett's

VITONAGEN

Brand

RECONSTRUCTIVE TONIC

Vitamin B_1, Glycerophosphates and Strychnine in a palatable base. Particularly suitable for administration in cases of Neurasthenia, Neuritis, general debility, etc.

DOSE: *One to two teaspoonfuls with water three times daily after meals.*

Bottles of 4 fl. ozs. and 8 fl. ozs.

Bottles of 20 fl. ozs. and 90 fl. ozs. for dispensing.

Contains: Calc. Lact. B.P. 4 grs., Pot. Glycerophosph. Liq. B.P.C. 8 mins., Sod. Glycerophosph. B.P.C. 2 grs., Acid. Glycerophosph. B.P.C. 8 mins., Vitamin B_1 B.P. 2·4 mgms., Strych. B.P.C. 1/75 gr. Flavoured Basis to one fluid ounce.

C. J. HEWLETT & SON LTD.

Manufacturing Chemists

KING GEORGE'S AVENUE, WATFORD, HERTS.

and at 216, ORR STREET, GLASGOW, S.E.

Even in these enlightened days . . .

guidance in methods of Family Planning can do much to remove anxiety and promote a patient's mental and physical well-being.

In order to accommodate individual preference two types of contraceptive are presented.

GYNOMIN

The scientifically balanced, antiseptic and deodorant contraceptive in tablet form.

The average weight of each tablet when packed is 1.2 grams, and contains w/w.

FORMULA

Sodium Bicarbonate B.P.	12.7
Tartaric Acid	11.1
Sodium p-toluensulphon-chloroamide B.P.	1.1
Perfume q.s.	
Excipients to	100.0

ANTEMIN

A recently introduced cosmetic-type cream simple in application, possessing efficient spermicidal and dispersive power. Pleasant in use. Reasonably priced.

FORMULA

Sodium dioctyl sulpho-succinate	0.25
Ricinoleic Acid B.P.	1.00
Boric Acid B.P.	1.00
Trioxymethylene B.P.C.	0.15
Base to	100.0

Both these products are approved by the Family Planning Association who advise that, for maximum safety, any chemical contraceptive should be used in conjunction with a mechanical barrier.

Medical literature and samples on request

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Ortho DE-LUXE Kit

. . . discreet, practical

complete prescription for dependable conception control

containing: **Ortho-Gynol** vaginal jelly
Ricinoleic acid and
p-Diisobutylphenoxypolyethoxyethanol
in a vegetable gum base buffered at pH. 4.5

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Ortho Diaphragm
and matching
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in washable, elegant and durable zipper bag of plastic yarn

LITERATURE ON REQUEST

Ortho Pharmaceutical Limited

Ortho

HIGH WYCOMBE · BUCKINGHAMSHIRE · ENGLAND

AGAINST MALNUTRITION

'VIMALTOL', a delicious, nourishing vitamin preparation, has achieved wide popularity as a supplementary food item against malnutrition in infants, children and adults. It can be used with advantage whenever nutritional levels are unsatisfactory. It can also be usefully employed when vitamin intake is insufficient, for example, due to distaste for natural vitamin-bearing fruits and other foods.

'Vimaltol' is a quality product from the 'Ovaltine' Research Laboratories. Its balanced formula, which includes special malt extract, high vitamin potency yeast, halibut liver oil and iron, has been developed in the light of recent findings of dietetic science. 'Vimaltol' actively assists in growth and development and helps to raise resistance against the onset of infection.

For these reasons, it is widely prescribed for the young because of their higher metabolic requirements. It is highly palatable, readily assimilable and quickly available.

VIMALTOL

For Infants, Children and Adults

Each ounce contains:

1420 i.u. of Vitamin A	710 i.u. of Vitamin D
0.35 mg. of Vitamin B_1	2.8 mg. of Niacin (P.P. Vitamin)
0.2 mg. of Vitamin B_2 (Riboflavin)	3.3 mg. of Iron

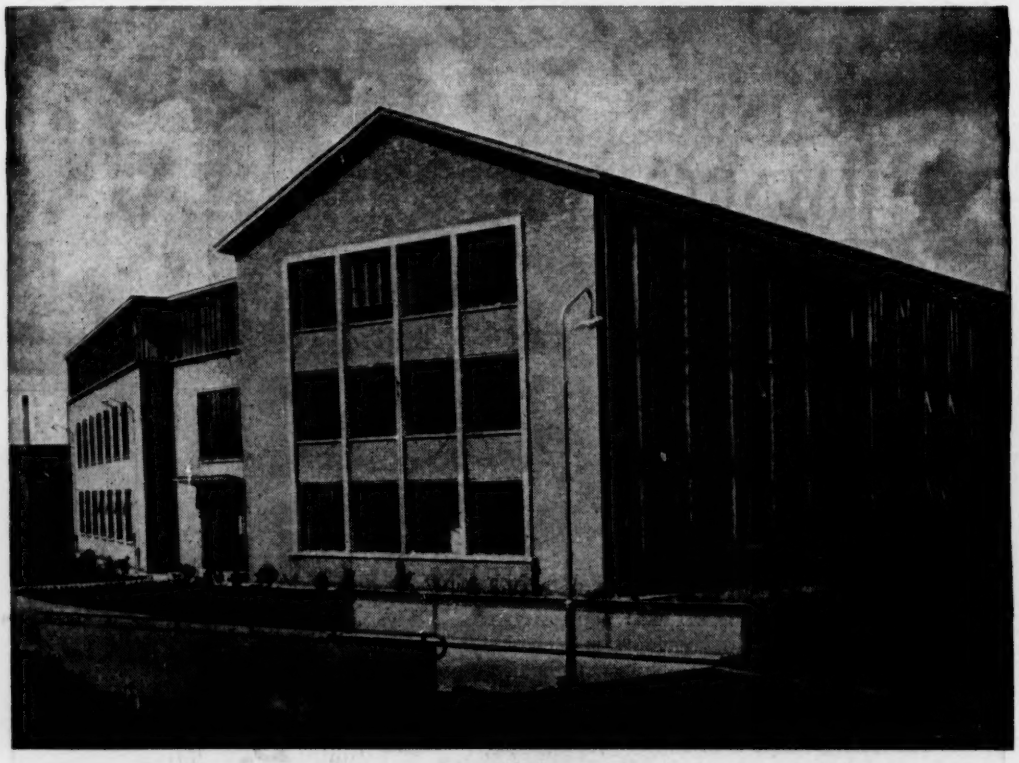
in a readily assimilable form.

Clinical samples on physicians' request to The Medical Dept.,

A. WANDER LIMITED,
42 Upper Grosvenor Street,
Grosvenor Square, London W.1.

Visit Stand No. 112 at the London Medical Exhibition, Royal Horticultural New Hall, Greycoat Street, London S.W.1, November 15–19.

M.377



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Basic materials for the pharmaceutical and foodstuff industry

Preparations for the fortification of fodder

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Insecticides for anti-malaria and hygienic purposes, fungicides, weedicides

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PHILIPS-ROXANE strive for A HEALTHY WORLD

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12

OLIGAEMIC SHOCK

THIS WOMAN is in shock. Her blood pressure must be raised swiftly and maintained, now, during any operation which may follow, and in the post-operative period.

A CLEAR CASE FOR DEXTRAVEN, the *optimal* fraction dextran.

DEXTRAVEN raises the blood pressure swiftly and surely, and because there is minimum wastage stays in the circulation in significant concentration during the critical 24 hours.

DEXTRAVEN can be given immediately by intravenous infusion. It is stable indefinitely under all climatic conditions—no special storage precautions are necessary. DEXTRAVEN is approved by the Ministry of Health. Fully descriptive literature is available and a Technical Information Service is always at your disposal.

A clear case for DEXTRAVEN

TRADE MARK

BENGER LABORATORIES LIMITED · HOLMES CHAPEL · CHESHIRE

A BENGER PRODUCT

D.2

KEEP WINTER'S GRIP FROM HAND AND FOOT
PROPHYLAXIS AND TREATMENT OF
Chilblains
Sterogyl-15
VITAMIN D2 (ROUSSEL)
600,000 I. U.
60% success with 3 doses
ORAL—MASSIVE DOSE
ALCOHOLIC FOR ADULTS
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Basic N.H.S. cost
Dispensed from packs of 6 3 1
Price to chemist per ampoule 2/- 2/3 2/4
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LONDON, N.W.10.
LADBROKE 3600

The advantages of FENOX nasal drops

Fenox gives two-stage vasoconstriction—prompt and sustained—without side effects

Fenox is non-oily—no interference with ciliary action, no danger of lipoid pneumonia

Fenox remains at the site of action —same viscosity as mucus

Fenox is non-irritant —*p*H adjusted and isotonic with nasal secretion.

Fenox is readily absorbed by the mucosa—low surface tension.

Fenox is suitable for both children and adults.

THE IDEAL NASAL DECONGESTANT

FENOX, the only preparation containing phenylephrine hydrochloride *and* naphazoline nitrate, marks an advance in the local treatment of catarrhal conditions of the nasal passages and accessory sinuses. It exhibits all the properties of the ideal nasal decongestant.

FENOX is supplied in ½ fl. oz. dropper bottles. RETAIL PRICE 2/6d., subject to usual discounts.

Literature and "Patients' Directions" pads are available from the Medical Department, Boots Pure Drug Co. Ltd. Nottingham

Boots

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mandelic acid ester of 3.5.5-trimethyl-cyclohexanol

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SPASMOCYCLONE (CYCLOMANDOL) BS 572*

Clinical investigations carried out in several parts of the world as reported in the medical press have established CYCLOSPASMOL as a very effective vasodilator in the treatment of peripheral vascular diseases.

Due to its low toxicity there is a complete absence of undesirable side effects.

* *protected by patents e.q. patent applications*

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HICOSEEN REGD.

HOMMEL

A new, highly effective expectorant

on an original basis

The principal constituent of 'HICOSEEN' is *2-Diethylaminoethyl-phenylethyl-acetate*, synthesized by Hommel and for the *first time* clinically used. It acts broncholytically and at the same time sedatively on the cough reflex.

'Hicoseen' provides the basic requirements of anti-tussic therapy: repression of cough reflex and promotion of expectoration. These are accomplished with a very high degree of compatibility.

HOMMEL

PHARMACOLOGY

Absence of side-effects, including drowsiness, is of outstanding importance. The respiratory centre not being acted on in any way, the cough reflex is probably influenced by a mechanism different from that of morphine alkaloids. 'Hicoseen' contains such a small dose of codeine phosphate that even high overdosage is innocuous.

COMPOSITION

2-Diethylaminoethyl-phenylethyl-acetate	0.1%
Codeine phosphate	0.08%
Guaiacol albuminate	5.25%

in pleasantly flavoured syrup

INDICATIONS

Specific in cough irritation, bronchial catarrh, bronchitis, tracheo-bronchitis in emphysema and pulmonary tuberculosis.

DOSAGE

Adults: 2 to 4 dessertspoonfuls daily; in case of cough irritation, 1 teaspoonful on each occasion up to 10 teaspoonfuls daily.
Children: according to age and number of cough paroxysms 3 to 5 tea- or dessertspoonfuls daily.

PRESENTATION

'Hicoseen' Syrup is available in bottles containing 4 fluid oz.; also in 16 fluid oz. bottles for dispensing.
PERMISSIBLE ON THE N.H.S.

PROFESSIONAL SAMPLE AND LITERATURE ON REQUEST

HOMMEL'S HÆMATOGEN & DRUG CO., 121 Norwood Road, London S.E.24

Seasonal illnesses come and go, but there is no season of the year when Tyrosolven Antibiotic-Anaesthetic Lozenges are not a valuable addition to the range of drugs used in throat infections. Tyrothricin, the active principle in Tyrosolven, is effective against a wide spectrum of bacterial flora — haemolytic streptococci, enterococci, vibrioform and fusiform bacilli, and spirochaetes; there are therefore few common mouth infections they will not relieve. Tyrosolven also contains benzocaine, an effective analgesic.

ACTIVE CONSTITUENTS:
Tyrothricin 1 mg., benzocaine 5 mg.

Tyrosolven

Tyrosolven has never been advertised to the public.

William R. WARNER & CO. LTD.,
Power Road, London, W.4.

Packing:
Packs of 20 lozenges;
dispensing packs of 250 supplied to chemists at 16/8.

'Sulphamezathine' (Sulphadimidine B.P.), long valued for its potency and high safety factor, is now the cheapest of the commonly used sulphonamides.

ICI

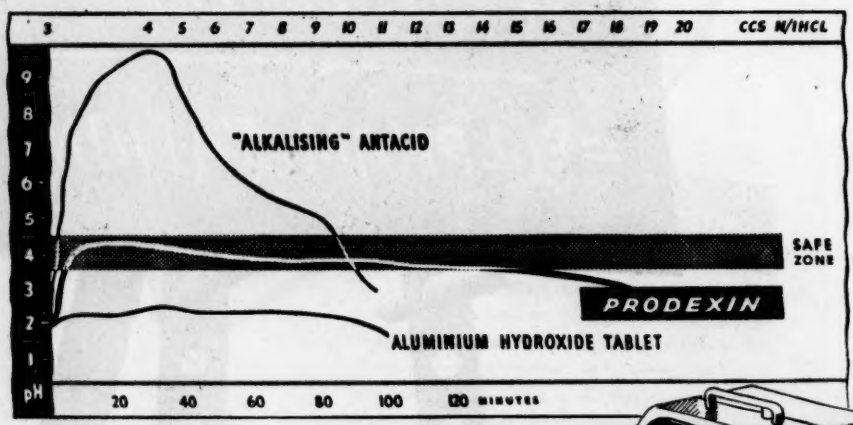
IMPERIAL CHEMICAL (PHARMACEUTICALS) LIMITED

A subsidiary company of Imperial Chemical Industries Limited **WILMSLOW, MANCHESTER**

Ph.478

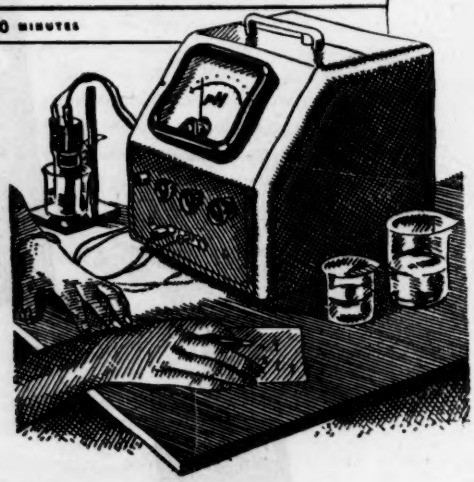
A New development providing CONTROLLED antacid therapy

Prodexin is a new product containing aluminium glycinate, and belongs *to the buffer group of antacids. It depends for its action upon the slow* release, on hydrolysis, of active aluminium hydroxide gel and glycine (amino acetic acid). *Glycine rapidly raises the pH to 2, sparing the* aluminium gel for the later stage of raising it into the "safe zone" of pH 3·5 to 4·5. Prodexin maintains an equable gastric environment for long periods without alkalisation.


3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 CCS N/1HCL
9 8 7 6 5 4 3 2 1 pH
"ALKALISING" ANTACID
SAFE ZONE
PRODEXIN
ALUMINIUM HYDROXIDE TABLET
20 40 60 80 100 120 MINUTES

Prodexin provides a convenient, economical and safe treatment for HYPERACIDITY and PEPTIC ULCER.

The tablets, sucked one at a time, maintain the pH of the stomach contents within the "safe zone" for up to two hours. With Prodexin there is no risk of acid rebound or alkalosis. Prodexin tablets are pleasant to suck and they do not form gritty particles in the mouth or give rise to constipation.



PRODEXIN

Each tablet contains:—

Aluminium glycinate.....0·9 gramme.
(*dihydroxy aluminium aminoacetate*)
Light magnesium carbonate.....0·1 gramme.

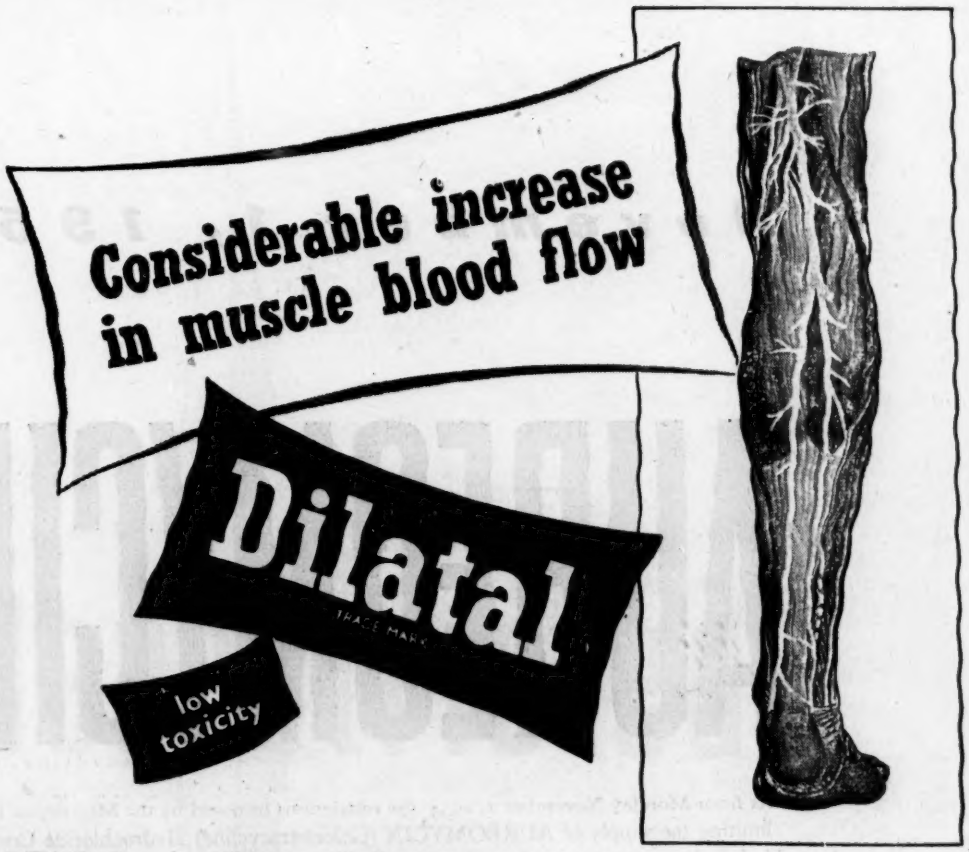
The basic N.H.S. cost of treatment at the rate of 6 Prodexin tablets daily is 8½d.

Manufactured in the laboratories of

C. L. BENCARD LIMITED

MINERVA ROAD · PARK ROYAL · LONDON N.W.10

BENCARD



Widely indicated in the treatment of circulatory disorders

- INCREASED CARDIAC OUTPUT MAINTAINS MEAN ARTERIAL PRESSURE.
- DIRECT ACTION ON THE MUSCULATURE OF THE BLOOD VESSELS.

DILATAL* is safe and rapidly effective by oral and parenteral administration. Available in tablets (2.5 mg. in containers of 100 and 500) and ampoules (5 mg. in 1 ml.—in boxes of 12).

* 1-(p-hydroxyphenyl)-2-(1'-methyl-2'-phenyl-propylamino)-propanol-(1) hydrochloride

SMITH & NEPHEW LTD.,
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the marketing organisation of Herts Pharmaceuticals Ltd., the manufacturers and owners of the trade mark DILATAL.

GM186

November 1, 1954

AUREOMYCIN*

CHLORTETRACYCLINE, *Lederle*

As from Monday November 1, 1954, the restrictions imposed by the Ministry of Health, limiting the supply of AUREOMYCIN (Chlortetracycline) Hydrochloride Crystalline *Lederle* to hospitals, are completely removed. As from that date doctors are free to prescribe AUREOMYCIN in general practice whenever required for private or National Health Service patients without restrictions. AUREOMYCIN is manufactured in the United Kingdom and is in adequate supply for doctors and hospitals. AUREOMYCIN (Chlortetracycline) is the original broad-spectrum antibiotic which combines potency with safety and economy. More reports have appeared on the excellent clinical results with AUREOMYCIN than any other broad-spectrum antibiotic. There is a form of AUREOMYCIN for every purpose.

Can be prescribed on N.H.S. Form E.C.10

AUREOMYCIN *means* GREATER ACTION / SMALLER DOSAGE / LOWER COST

*TRADE MARK

Technical literature on request.

LEDERLE LABORATORIES DIVISION *Cyanamid Products Ltd.*

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Capsules
Dental Cones
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Vaginal Powder

‡ *At present available to hospitals only*

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23

The paroxysmal abdominal pain of infantile colic is a result of smooth muscle spasm of the gastro-intestinal tract. It is therefore most effectively relieved by the administration of 'Merbentyl' Syrup, the new form of the antispasmodic 'Merbentyl'. Strikingly free from the side effects usually associated with antispasmodic therapy, 'Merbentyl' Syrup is particularly suitable for administration to infants and children; especially as they enjoy its clean, clear taste.

'Merbentyl' Syrup is available in bottles of 4 and 20 Fl. oz.

Merrell research

MERBENTYL
SYRUP
REGD

distributed in the United Kingdom & Eire by
RIKER LABORATORIES LIMITED, LOUGHBOROUGH, LEICS.
for the Wm. S. Merrell Company, London.

ALSO AVAILABLE

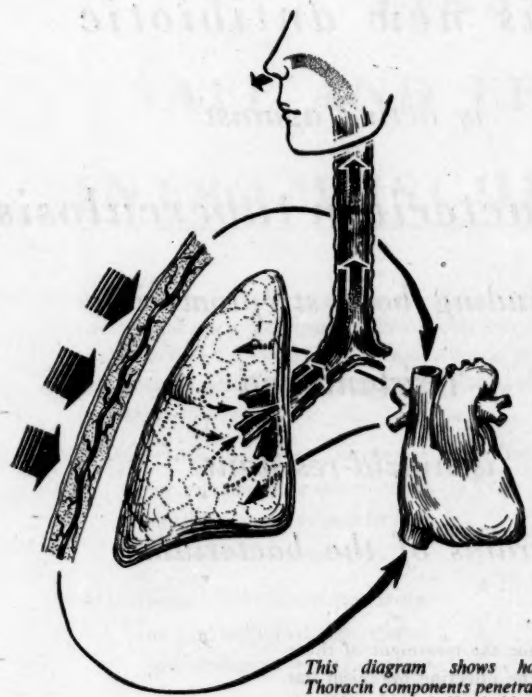
'Merbentyl' Tablets each containing 10 mg. Diethylaminocarbethoxy-bicyclohexyl hydrochloride.

'Merbentyl' with Phenobarbitone Tablets each containing 10 mg. Diethylaminocarbethoxybicyclohexyl hydrochloride and 15 mg. Phenobarbitone.

Each in bottles of 50 and 250 tablets.

A NEW ADJUVANT IN THE TREATMENT OF RESPIRATORY DISORDERS

Lloyd-Hamol Ltd., of London and Zurich, presents to the medical profession a new decongestive salve, Thoracin, for the symptomatic relief of coughs, colds and respiratory disorders.



This diagram shows how Thoracin components penetrate the skin, are carried by the blood-stream to the alveoli and excreted there to exert their effect.

▶ The Thoracin formula is based on the same principles that have made Transvasin so successful in the treatment of rheumatic conditions.

▶ Thoracin is composed of esters of substituted hydroxy aromatic derivatives.

▶ Thoracin achieves the effect of the classic counter-irritant remedies — poultices, plasters and cupping — without irritation of the skin.

▶ Thoracin contains a new ester of Guaiacol that is entirely free from the evil smell and irritant effect associated with this phenol derivative in its pure form. This ester easily penetrates the skin, and is excreted in the alveoli, where it exerts its well-known action.

▶ Thoracin ensures vasodilation of the superficial skin vessels by the use of esters of nicotinic acid.

▶ Thoracin relieves reflex spasm of the pectoral muscles by the use of the tetrahydrofurfuryl-ester of salicylic acid.

▶ Thoracin brings to the alveoli via the blood stream the sedative, antispasmodic, and expectorant properties of camphor and eucalyptus.

THORACIN is available in 1 oz. tubes — basic price 2/6 plus 7½d. P.T. It is an ethical product, and is not advertised to the public. Since a very small quantity is sufficient for each application, the cost of treatment is extremely low. *Samples and literature will be gladly sent on application.*

FORMULA

Phenyl Ethyl Nicotinate	2.0%w/w
Guaiacol Furoate	5.0%w/w
Tetrahydrofurfuryl Salicylate	10.0%w/w
Camphor	3.0%w/w
Eucalyptol	2.0%w/w
Water-Miscible Base to	100.0%

LLOYD-HAMOL LTD.

11 WATERLOO PLACE, LONDON S.W.1
AND AT ZURICH

Thoracin is the registered trade mark of Lloyd-Hamol Ltd.

THORACIN

MADE BY THE MANUFACTURERS OF TRANSVASIN

VIOCIN

Pfizer brand of viomycin sulphate

This new antibiotic

is active against

Mycobacterium tuberculosis

including both streptomycin-resistant and isoniazid-resistant strains of the bacterium

Viomycin Sulphate is suitable for the treatment of those cases of tuberculosis in which the infecting organism has become resistant to other antituberculous agents. Available in vials of 1 Gm. viomycin sulphate for intramuscular injection.

Now available for supply direct to Hospitals.

Pfizer — *World's Largest Producer of Antibiotics*

Full literature is available and will be supplied on request.

PFIZER LTD · FOLKESTONE · KENT · tel: Folkestone 51771

21C

New

FIRST

SAFE AND EFFECTIVE

INTRAMUSCULAR IRON

BENGER LABORATORIES, who introduced the first intravenous iron preparation, now present a new and equally effective iron complex for intramuscular administration. ITS NAME IS IMFERON. The introduction of this new compound considerably simplifies the control of iron deficiency anæmias in both hospital and general practice. *Note these advantages . . .*

★ **Imferon** is the first safe and effective iron preparation for intramuscular injection—equally suitable for general practice and hospital use.

★ **Imferon** is well tolerated. Reactions of the kind which have been reported with saccharated oxide of iron have not been observed.

★ **Imferon** produces a haemoglobin response identical with that obtained by saccharated oxide of iron. The response is thus predictable.

★ **Imferon** provides the equivalent of 250 m.g. of iron per 5 ml. injection; fewer injections are therefore necessary to administer the calculated total dose.

AMPOULES 2 ml. (100 *mg. Fe.*) boxes 10 and 100. AMPOULES 5 ml. (250 *mg. Fe.*) boxes 5 and 50.
Fully-descriptive literature on request. A Technical Information Service is at your disposal.

Imferon TRADE MARK

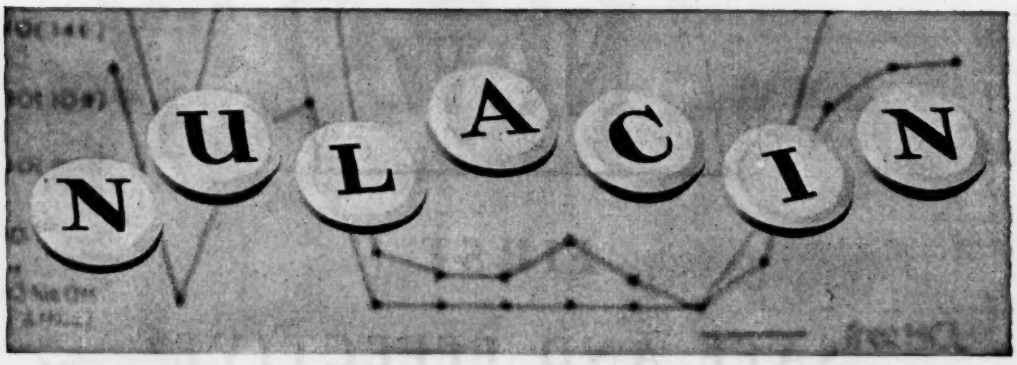
Iron-Dextran Complex

A PRODUCT OF

BENGER RESEARCH

BENGER LABORATORIES LIMITED · HOLMES CHAPEL · CHESHIRE

MILK-ALKALI DRIP THERAPY WITHOUT DISCOMFORT



GASTRIC ACIDITY can now be controlled effectively, and without the inconvenience of intragastric milk-alkali drip therapy. This is made possible with the help of NULACIN.

Before NULACIN was evolved, a continuous antacid effect could only be achieved under hospital conditions, and with discomfort to the patient.

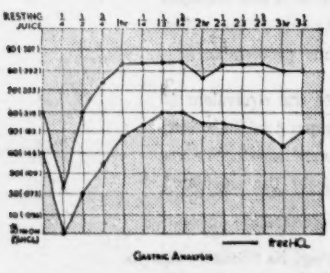
INDICATIONS

NULACIN tablets are indicated whenever neutralization of the gastric contents is required: in active and quiescent peptic ulcer, gastritis, gastric hyperacidity.

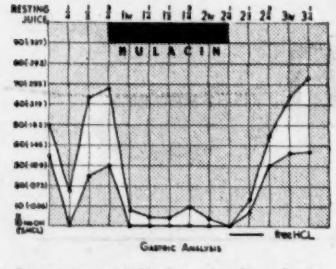
Beginning half-an-hour after food, a NULACIN tablet should be placed in the mouth and allowed to dissolve slowly. During the stage of ulcer activity, up to three tablets an hour may be required. For follow-up treatment, the suggested dosage is one or two tablets between meals.

NULACIN tablets are not advertised to the public and have no B.P. equivalent. May be prescribed on E.C.10. The dispensing pack of 25 tablets is free of Purchase Tax. (Price to pharmacists is 2/-.) Also available in tubes of 12.

NULACIN tablets are prepared from whole milk combined with dextrins and maltose, and incorporate Magnesium Trisilicate 3.5 grs.; Magnesium Oxide 2.0 grs.; Calcium Carbonate 2.0 grs.; Magnesium Carbonate 0.5 grs.; Ol. Menth. Pip. q.s.



Superimposed gruel fractional test-meal curves of five cases of duodenal ulcer.



Same patients as in Fig. 1, two days later, showing the striking neutralizing effect of sucking Nulacin tablets (3 an hour). Note the return of acidity when Nulacin is discontinued.

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Clinical Investigation into the Action of Antacids. *The Practitioner* July, 1954, **173**:46

NULACIN is available throughout the British Commonwealth, in the U.S.A. and many other countries. It is known as NULACTIN in Canada and Sweden.

Horlicks Limited

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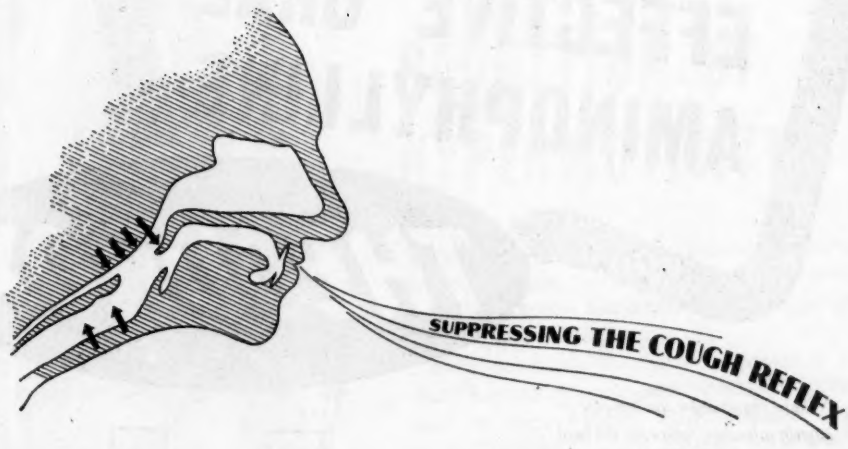

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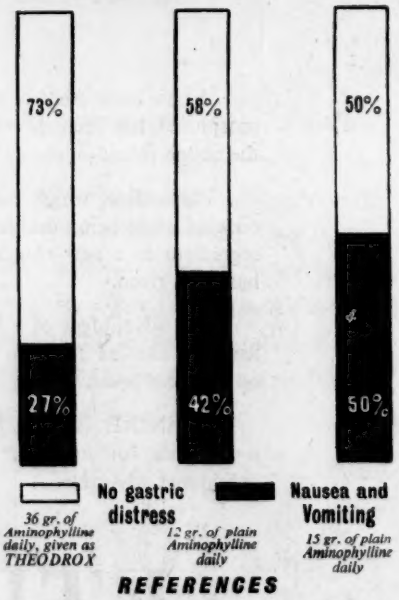

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THE MALNOURISHED COMMUNITY

CARE OF MOTHERS AND CHILDREN AS A FIRST STEP TOWARDS IMPROVED FEEDING

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A LARGE proportion of the population of the world is suffering from malnutrition. As this is progressively eliminated, by reducing ignorance and developing natural resources, the demand for food will increase, because lives will be saved and the expectation of life will be lengthened. A still greater burden will fall on the food-producer when, with economic development, labour is diverted from subsistence agriculture to the production of crops for export or for industries. It has, for example, been estimated that in tropical Africa in recent decades 30% of the land under crops and 40% of agricultural labour has been diverted to production for export and domestic markets (United Nations 1954).

Change is inevitable, but its objective should be a desirable standard of life and of living. The introduction of improved techniques will raise many technological problems, but these are more likely to be solved than the cognate social, political, and human problems. One which is often overlooked is the importance of producing healthy human beings. Sick children cannot be properly educated nor can people suffering from chronic ill health be efficient at their work.

Development schemes can be divided into two main groups—large ones, usually connected with some huge engineering project, and small ones operating at the village level. Plans for these two sorts of schemes should have much in common, but it is with the initiation of small-scale enterprises that I am particularly concerned (Platt 1954a). Such enterprises need to be shaped to fit the circumstances and conditions of the community and may vary with its degree of sophistication or urbanisation; unsatisfactory and even unfortunate results have sometimes followed the imposition of measures successful in European countries. The general aim should be preventive—i.e., to avoid political, social, and economic as well as medical ills, rather than to rescue casualties in these fields as has been the case in the past.

The Small Enterprise

In my opinion the best starting-point for such schemes would be to introduce measures designed to improve the health and welfare of mothers and their children (Platt 1953, 1954b). Improvement of the health of the women would lead immediately to increased capacity for work and therefore to improvement of food-supplies, since women in underdeveloped countries generally have a special rôle in producing, processing, and preparing food eaten by the community. When the women's coöperation is secured, losses of growing crops and of stored foodstuffs might be prevented and fuller use made of potential food resources, thus contributing to increased productivity—one of the essentials of development.

Much therefore might be achieved before contemplating the introduction of large-scale schemes of crop production. But in these, too, the women should surely be included. For example, when men, in their customary rôle of producers of cash crops, are initiated into new techniques of production, then, simultaneously, these techniques should be offered to the women for the production of food crops. It is essential in such development plans to recognise the need for reducing the time spent on time-consuming operations, and—particularly in women's work—the time spent on domestic pursuits (Platt 1946). Also, in reducing labour costs of operations, special thought must be given to the design of devices for use in underdeveloped communities; those already employed in developed communities may not be applicable. A basic necessity would seem to be a small power unit, run on locally produced fuel, to generate light, to pump water, and to drive a simple grain-mill.

Obviously any plan, to be successful, must be acceptable to the people. It will have enhanced value if it can serve as a vehicle for putting other new ideas across. Care for the child will have an emotional appeal since, whatever may be said to the contrary, people of primitive communities are attached to their children; it will also have an economic appeal since backward peoples usually have many children so that some shall survive to support their parents in their old age. Measures directed towards the improvement of the health and welfare of mothers and children are therefore likely to be taken up and the people's coöperation secured so that work may be expected to continue after the initiators have withdrawn. If this is assured then one of the main criteria of success in development work will have been satisfied.

Such an unpretentious plan would be comparatively inexpensive to start and run; it also has the merit that it could be introduced at the family level. (F.A.O./W.H.O. 1953). It is particularly applicable to rural communities which often cannot be reached by the large schemes. It would also provide a sound basis for further development.

Consequences

Welfare work among women and children will help to solve one of the most serious problems in tropical countries—i.e., the high child and maternal mortality. Concern is often expressed (Medical Research Council 1953) at the prevalence in some countries of rates of 50 infant deaths or less per 1000 live births; but very much higher rates, up to about 500 per 1000, occur in some tropical communities (Platt 1954a). Sometimes the infant-mortality rates are lower, but then higher death-rates are found in early childhood; so it would be safe to say that it is common to find that half the children born die during the first decade of life. Can we stand aloof and ignore this appalling state of affairs? Must we not, on humanitarian and ethical grounds, do what we can to prevent it? Why indeed has attention not been given to this before now? The reply to the last question must be that the facts were not, until recently, sufficiently well established. There is reason to believe that, when death-rates are very high, they can be attributed about equally to malnutrition and to the effects of such tropical diseases as malaria (Platt 1954a). This, however, is not the place to attempt to disentangle the relative importance of malnutrition and zymotic agents in causing death and disease in tropical countries; sooner or later both will have to be eradicated.

One requisite of any improvement scheme must be the production and rearing of a healthy citizen. To achieve this, attention must be given to the health of women throughout pregnancy, since there is evidence that the foundations of the nutrition of the infant are laid in prenatal life and that the first three months of fœtal life are specially important. Care beginning in prenatal life is likely to be a more successful means of achieving this objective than the current attempts to repair the bodies of individuals already suffering from the effects of malnutrition, which are, indeed, often irreversible.

An immediate consequence of better feeding of the mother would be that she would produce ample milk daily and during a prolonged lactation. This increased daily yield would eliminate protein malnutrition in breast-fed infants, and the lengthening of adequate lactation would reduce mortality and morbidity among children in the second year of life, particularly those who are being weaned on to diets low in protein and

relatively high in carbohydrate. Such an improvement in lactation would therefore contribute to eradication of protein malnutrition in children—a widespread and serious problem to which much attention has latterly been given (Platt 1953, F.A.O./W.H.O. 1953, Nutrition Conference 1954).

Traditional Method

It is pertinent at this point to illustrate the need, when making plans, to combine "the urge towards innovation with the legitimate restraints of custom" (Martin 1954). Mothers in primitive communities are being advised to cease breast-feeding during the second six months of the infant's life. This "European" practice has been coupled, especially in countries where cow's milk or manufactured preparations of it are not available or obtainable, with a hunt for substitutes. I am not entirely convinced that artificial feeding of infants in the first year of life is completely free from ill effects on health in later life (Platt, unpublished); and, in the conditions prevailing in backward communities, it would seem to be particularly stupid and ill advised to interfere with the customary practice of feeding some breast-milk for the first two and a half to three years of the child's life. It is certain, however, that one consequence of accepting this is that proper feeding of the mother must be assured throughout the whole period of childbearing and suckling.

I would, in this connection, draw attention to the fact that not long ago primitive methods of suckling were criticised on the grounds that they were haphazard, the infant being given the breast whenever it appeared to want to be fed—i.e., "on demand." But in the most up-to-date pædiatric practice this method is now preferred to that of feeding by a rigid time schedule (Platt 1954b).

Another example of the value of traditional practices is the custom in primitive communities of spacing the birth of infants to about two and a half to three years, thus permitting the infant its birthright of breast-milk. Various sanctions are applied to discourage the shortening of this interval, and in some communities the "deposed child" is recognised to be a likely victim of protein malnutrition. It is of interest that two and a half to three years is the time-interval which medical men in modern communities have recommended as being desirable for the health of the mother.

The practice of mixed feeding—i.e., introducing foods additional to breast-milk—is widespread in unsophisticated communities and, so far as our knowledge goes, is one to be encouraged (Platt 1954b). The selection of suitable foods for mixed feeding, and the design of a diet for the mother to enable her to maintain adequate lactation for two to three years, might well be two of the main initial items in a programme of infant and maternal care.

The Rôle of Women

We may conclude then, that in the feeding of infants and young children some traditional practices have merits which rival those of civilised techniques. Do similar conflicts arise in economic and social matters? Although I feel less well qualified to speak about these, I would like briefly to compare some changes in English villages in the past two centuries with those threatening the villages of tropical Africa today. The economists envisage profound changes in the division of labour between men and women in agricultural communities in tropical Africa in the future (United Nations 1954); would they do so with complacency if they appreciated that in England since 1750 the retreat of women from outdoor activities into the home can be "cited among several principal causes of village degeneration" (Martin 1954)? Economic plans for Africa are being made without giving much consideration to the rôle of the women, and it is sometimes stated that in under-developed countries they are only beginning to emerge as socially conscious and responsible individuals. It is, however, likely that, as has been said of English village women, they "are at work all the time behind the scenes, as they have always been, influencing their husbands in a wide variety of ways" (Martin 1954).

Pressure of shortage of food in England during the first world war resulted in the introduction of Women's Institutes, and by the end of the second world war there was an enormous increase in their number and membership. During these crises they were mainly occupied with increasing the production of food and processing and preserving it. In tropical Africa pressure to produce food is more or less continuous, and it would seem that advantage should be taken of this incentive to confirm women in their rôle of food-producers and to band them together into useful social units such as Women's Institutes. In rural England these institutes help to "provide not only more food for the body but a more varied intellectual diet" and women play a special part in "fostering a new sense of relationship and a better sense of values" (Martin 1954). Is it not exactly such opportunities for cultural development as well as for material production which those who complain of the disintegration of indigenous social and moral systems (Ajose 1954) should be looking for?

A further advantage of the proposed welfare work would be the raising of the status of women in society. In civilised communities improvement of the status of women and a rise in the standard of living have been recognised as two elements in a complex of interrelated economic and social factors which have contributed to the limitation of the size of families (Banks 1954, United Nations 1953). The likelihood that the same changes would occur in developing communities is another reason for supporting the scheme proposed. It will be clear that in this scheme the specialist staff would be well placed and well qualified to furnish advice on family planning; and it might be that, if they were successful in their work, mothers would spontaneously seek from them advice on how to limit the number of their children.

Summary

Maternal and child-welfare work is recommended as a first step in promoting social and economic development among unsophisticated peoples. The scheme at the outset could be unpretentious and relatively inexpensive; it is likely to have emotional and economic appeal and therefore to be acceptable and self-perpetuating; it would provide a basis for future expansion. An immediate increase in food-supplies and enhanced productivity could be expected to follow the introduction of the scheme since, in many communities on a subsistence economy, women are the main food-producers. Other consequences would be a reduction in the appallingly high mortality and morbidity rates among children and the production and rearing of healthy children.

The need for tempering "the urge towards innovation with the legitimate restraints of custom" is emphasised and illustrated by reference to certain indigenous practices. It is argued that the status of women in village society should be safeguarded and improved for social as well as economic reasons. Stress is laid on the importance in development work of relating resources to the size of the population; in the plan proposed there would be scope for the application of knowledge of family planning.

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THE ANTI-THYROID ACTION OF PARA-AMINOSALICYLIC ACID

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IT has been known for some years that many aminophenol compounds have a goitrogenic action, and Astwood et al. (1943) showed that *p*-aminobenzoic acid inhibited thyroid-gland function in rats. This drug was subsequently thought to be a clinically effective anti-thyroid drug by Berman (1945), although Goodwin et al. (1949) proved its action to be only very slight.

The closely related substance *p*-aminosalicylic acid (4-amino-2-hydroxybenzoic acid) and its sodium salt, sodium *p*-aminosalicylate (P.A.S.), have been extensively used in the treatment of tuberculosis since the introduction of the former by Lehmann (1946). Beattie and Chambers (1953) and Wong et al. (1953) showed that the thyroid metabolism of rats receiving P.A.S. for short periods was depressed. Relatively few cases of goitre and hypothyroidism due to P.A.S. have been reported in man (Bergqvist and de Maré 1951, Clausen and Kjerulf-Jensen 1951, Komrower 1951, Librach 1952, Hamilton 1953, Davies and Galbraith 1953, Davies et al. 1953, Brinkman and Coates 1954). Hanngren (1952) has shown that, if a sufficiently large dose of P.A.S. is administered intravenously in man, the concentration of radio-iodine by the thyroid gland is inhibited, and Balint et al. (1954) have shown by radio-iodine excretion tests that the thyroid gland is depleted of iodine after prolonged treatment with P.A.S.

It is therefore apparent that P.A.S. can in some circumstances, when used in normal dosage in the treatment of tuberculosis in man, produce clinical hypothyroidism. It is remarkable that more cases showing this side-effect are not observed.

We have tried to assess the true incidence of goitre and hypothyroidism in a fairly large group of patients under treatment with P.A.S., and the thyroid function of tuberculous patients receiving P.A.S. for prolonged periods has been studied clinically and by using radio-active iodine.

Methods

We began to be interested in this problem in 1952, and thereafter paid special attention to the possible development of goitre and hypothyroidism in patients receiving P.A.S. for long periods. The basal metabolic rate (B.M.R.) was calculated, and thyroid function (as shown by radio-iodine tests) was studied before and during P.A.S. therapy in 3 patients undergoing treatment for pulmonary tuberculosis. Detailed investigations were undertaken in 14 patients who ultimately developed either goitre or hypothyroidism. 2 patients who had received P.A.S. for a comparable length of time without the development of these clinical abnormalities were also studied.

The B.M.R. was estimated with a Benedict-Roth spirometer, and the results were expressed according to Aub and Du Bois (1917) standards. Studies with radio-active iodine were made by giving doses of 5–10 μC and making divided collections of urine from 0 to 8 hours, from 8 to 24 hours, and from 24 to 48 hours. The results were expressed in terms of percentage of the administered dose excreted in the urine after 48 hours. The normal range for the 48-hour excretion is between about 35% and 70%. The rate index, T, devised by Fraser et al. (1953), was calculated for each test done. By this technique the index T =

$$\frac{(\%\text{ dose excreted in 0–8 hr.}) \times 100}{(\%\text{ dose excreted in 8–24 hr.}) \times (\%\text{ dose excreted in 0–48 hr.})}$$

Values of 3–13 are found with normal thyroid function, higher values usually indicating hyperthyroidism or increased retention of radio-iodine by the thyroid after recent prolonged treatment with anti-thyroid drugs. Values of T below 3 indicate a tendency to hypothyroidism, and definite myxœdema is commonly characterised by an index of less than 2.

Results

Incidence of Goitre and Hypothyroidism

From January, 1952, to August, 1953, in 20 patients receiving sodium P.A.S. in the Tuberculosis Unit of Prof. John Crofton at Southfield Hospital, Edinburgh, the thyroid became enlarged, but this was not always associated with definite clinical hypothyroidism. During the same period 63 other patients received P.A.S. for a comparable period and did not develop a goitre. The incidence of induced goitre in this unit, therefore, was 20 out of 83 patients (23%). The shortest time in which a goitre became apparent was five months. All the patients received the usual dose of 20 g. of sodium P.A.S. daily; or, if a smaller dosage was given, the dose was based on the ratio of ½ g. per 3 kg. of body-weight a day. The P.A.S. was given in four divided doses in aqueous solution or in cachets.

During the same period (from January, 1952, to August, 1953) our attention was drawn by colleagues in the area to 9 more cases of hypothyroidism and goitre associated with P.A.S. therapy. A total of 29 cases were seen personally in one small area of Scotland in this period, and several more have been seen subsequently.

Clinical Features

The smallest aggregate dose of sodium P.A.S. that produced a goitre was about 2500 g. administered over 29 and 23 weeks to two boys aged 13 and 15 years (table I, cases 1 and 7). The type of tuberculosis in the patients in the goitrous and non-goitrous groups was clinically comparable; the average age of the 20 affected patients was 25, and that of the 63 unaffected patients, all treated for at least five months, was 29.

Goitre and Facies

Although no goitre was recognised clinically before the fifth month of treatment, some patients volunteered that they had been conscious of slight swelling of the neck several weeks previously. Furthermore, the gradual gain in weight that accompanies prolonged treatment for tuberculosis may lead to increased girth of the neck, masking the presence of a goitre. There may be, moreover, a surprising variation in the size of the goitre from week to week, and its ultimate clinical recognition may occasion surprise to the clinician that he had not recognised it earlier. The gland is usually soft and uniformly enlarged, and its presence is not often associated with

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Fig. 1—Goitre and hypothyroidism in a patient, aged 31, who had received 8·5 kg. of P.A.S. in 60 weeks (case 6).

symptoms of hypothyroidism. Some patients (see fig. 1), however, had most of the symptoms of myxœdema, with mental retardation, cold intolerance, and lack of energy, and 6 of the 20 were regarded as clinically hypothyroid.

One patient (fig. 2 and table I, case 14) developed a fairly obvious hypothyroid facies without appreciable goitre, and in his case, as in so many others, the striking change in his appearance and behaviour after treatment with thyroid extract confirmed the previous impression of hypothyroidism, and incidentally emphasised the great assistance that can be derived from serial photographs of such patients.

Basal Metabolic Rate

The B.M.R was estimated in 13 either goitrous or hypothyroid patients and in 2 apparently unaffected patients. The results are given in table I. In 6 cases the B.M.R. was less than −20%, and in all 6 clinical hypothyroidism was apparent. In a few cases serial estimations were made after the withdrawal of P.A.S., and the B.M.R. rose gradually to normal.

Blood-cholesterol

A less definite correlation was found in the blood-cholesterol levels, but there was a tendency for higher levels in patients with clinical hypothyroidism (table I).

Radioactive-iodine Tests

Tests of radio-iodine excretion were made in 14 goitrous patients while they were still receiving P.A.S. (table I) and subsequently repeated after P.A.S. had been withdrawn for 48 hours. When the patients were receiving P.A.S., the results of the test fell within the accepted normal range for 48-hours' excretion and T index (Fraser et al. 1953) in 7 patients. The other 7 patients had lowered T indices, and 4 of the 7 also had raised 48-hour total excretions. Of the 6 patients who were clinically hypothyroid 5 had low T indices (fig. 3 and table I). The 2 asymptomatic and non-goitrous patients (cases 15 and 16) investigated had 48-hour excretions and T indices within the normal range.

The radio-iodine tests were subsequently repeated after P.A.S. had been withheld for 48 hours, and in 2 patients the excretion of radio-iodine was assessed after six and twelve months. In 14 of the 15 cases tested after withdrawal for 48 hours (see table I, footnote), including the asymptomatic non-goitrous patients, a striking change in the pattern of excretion was observed, the 48-hour total excretion decreasing usually below 20% and the T indices rising to the range observed in patients who have received goitrogenic drugs. This change undoubtedly indicated that while P.A.S. was being taken it exerted a blocking effect, which was released on withdrawal of P.A.S., allowing the iodine-deficient thyroid gland to absorb and retain a greater amount of radio-iodine.

a *b*

Fig. 2—Hypothyroidism in case 14: *a*, after 53 weeks' P.A.S. therapy; *b*, after treatment with thyroid extract two months later, P.A.S. treatment being continued.

The patient tested after the lapse of six months (case 2) still had abnormal thyroid function, but after a year case 1 had a normal pattern of excretion of radio-

TABLE I—CLINICAL DATA AND RESULTS OF INVESTIGATIONS IN PATIENTS STUDIED

Case no.	Sex	Age (yr.)	Duration of P.A.S. therapy (weeks)	Total dosage of P.A.S. (to nearest 500 g.)	Goitre	Hypo-thyroidism	B.M.R. (%)	Blood-cholesterol (mg. per 100 ml.)	Radio-iodine tests			
									Receiving P.A.S.		Off P.A.S.	
									48-hr. excretion (% of dose)	T index	48-hr. excretion (% of dose)	T index
1	M	13	29	2500	+	−	−5	163	70	1·4	23	36·6
											43 (after 1 year)	3·3
2	F	23	33	3500	+	−	−5	204	60	1·6	22 (after 6 mos.)	29·6
3	F	20	39	5500	+	−	−10	132	63	3·5	11	28·6
4	M	27	49	7000	+	+	−33	191	74	1·3	10	23·1
5	M	19	28	3000	+	+	−22	130	84	2·3	24	20·5
6	F	31	60	8500	+	+	−23	303	83	1·7	89	1·1
7	M	15	23	2500	+	−	+7	143	45	7·2	18	15·6
8	F	22	60	7000	+	−	..	..	64	3·9	15	30·1
9	M	14	30	3000	+	−	−14	147	36	12·5	8	132·0
10	F	35	44	4500	+	−	−15	150	41	10·3	16	36·1
11	F	14	28	3500	+	+	−22	198	78	1·3	16	13·6
12	M	16	46	5000	+	+	−36	183	58	1·3	13	12·1
13	F	31	33	4500	+	−	−4	168	42	4·4	16	13·1
14	M	38	53	7500	−	+	−28	132	39	3·1	6	104·0
15	M	22	30	4000	−	−	−14	..	53	6·1	16	83·0
16	M	52	25	3000	−	−	−18	..	69	3·3	21	18·9

"Off P.A.S." means after P.A.S. had been withheld for 48 hours, except in case 2, where the interval was 6 mos., and the second observation in case 1, where the interval was 1 yr.

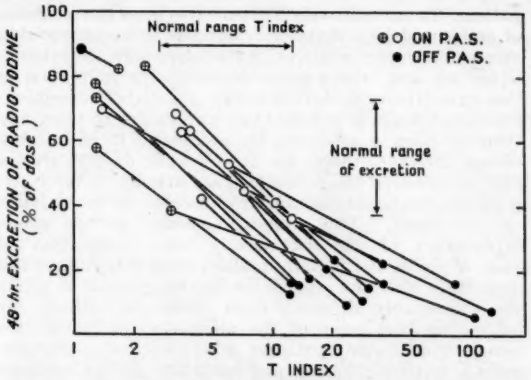

Fig. 3—48-hour excretion of urine and T index of patients receiving P.A.S. and effect of withdrawing P.A.S. for two days. In all patients but 1 a decreased excretion of radio-iodine indicated avidity of thyroid gland for iodine. Symbols containing a cross indicate hypothyroid patients.

iodine. Case 6, however, who had had P.A.S. for 14 months, behaved differently, showing no "rebound effect" when the radio-iodine test was repeated after the withdrawal of P.A.S. This may suggest that sufficient change had been induced in the thyroid gland by the prolonged treatment with P.A.S. to prevent it from concentrating radio-iodine after the cause of the blocking effect was removed.

3 previously untreated patients who were about to start treatment with P.A.S. and streptomycin were investigated, and the results are shown in table II. An initial decrease in B.M.R. was observed in 2 of the 3 patients, and a change in the excretion of radio-iodine was observed in all 3. The change indicated a block in the uptake of iodine while P.A.S. was being given, and on withdrawal of P.A.S. the avidity of the thyroid gland for iodine was apparent. No clinical change took place in the 3 patients during the three months that they received P.A.S but the later radio-iodine tests seemed to indicate the development of gradual compensation by the thyroid gland for the inhibiting effect of P.A.S. The changes in patient B are shown graphically in fig. 4.

TABLE II—BASAL METABOLIC RATES AND EXCRETION OF RADIO-IODINE IN 3 PATIENTS STUDIED UNDER TREATMENT WITH P.A.S.

Criterion	Time	Patient A (male, aged 39)		Patient B (male, aged 25)		Patient C (male, aged 32)	
	Before treatment	+22		+15		−11	
B.M.R. (%)	After 1 mo.	+7		−4		−15	
	After 2 mos.	−5		+1		0	
	After 3 mos.	−8		+19		..	
		Receiving P.A.S.	Off P.A.S.	Receiving P.A.S.	Off P.A.S.	Receiving P.A.S.	Off P.A.S.
Excretion of radio-iodine in 48 hr.	*Before treatment:* % dose	..	46	..	49	..	33
	T index	..	7·6	..	9·1	..	11·9
	After 1 mo.: % dose	42	41	75	21	34	24
	T index	3·7	8·2	2·4	16·4	6·4	24·3
	After 2 mos.: % dose	..	40	..	27	..	32
	T index	..	8·2	..	18·9	..	7·3
	After 3 mos.: % dose	79	39	85	50	..	..
	T index	2·4	11·7	3·5	17·4	..	..

"Off P.A.S." means 48 hr. after withdrawal of P.A.S.

Effect of Withdrawing P.A.S.

When P.A.S. was withdrawn, it was usual to note a gradual shrinkage in the size of the goitre, which in some instances was no longer apparent after a few weeks (fig. 5). In other cases several months passed before the goitre disappeared.

Effect of Administration of Thyroid Extract or Iodide

When, however, there was evidence of hypothyroidism, we invariably administered thyroid extract in moderate dosage, 60 or 120 mg. daily, while continuing to give P.A.S., and with this treatment the goitre tended to disappear more rapidly and there was parallel lessening of the hypothyroid state (figs. 2 and 6). The administration of iodide in large doses (600 mg. a day) to 1 patient while P.A.S. was still being taken, had no effect on the size of the goitre, although subsequent administration of thyroid led to shrinkage.

Effect on Tuberculosis

In this series there was no evidence of any deterioration in the lesions of tuberculosis for which the patients were

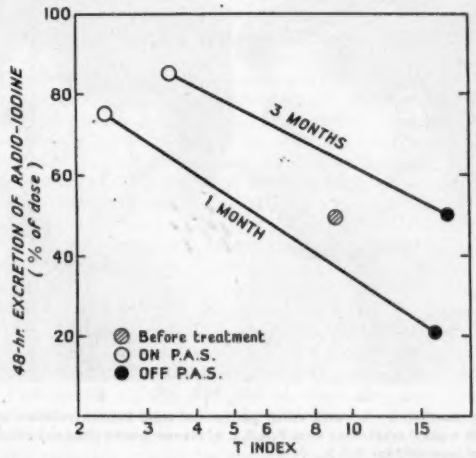

Fig. 4—Radio-iodine excretion in patient B before P.A.S. treatment, and after 1 month's and 3 months' treatment. Tests were made while patient was receiving P.A.S. (open symbols) and after P.A.S. had been withheld for 48 hours (solid symbols).

being treated, even in those patients who were most obviously hypothyroid from the administered P.A.S. Some personal experiences in the treatment of thyrotoxicosis in a few tuberculous patients—an association which is not often observed—suggest that induced hypothyroidism may occasionally be followed by an exacerbation of tuberculosis.

Effect of P.A.S. on Histology of Thyroid Gland

Biopsy specimens of the thyroid glands of patients studied in this series were not obtained, but through the courtesy of Dr. Bruce Cruickshank, of the department of pathology, University of Edinburgh, we have studied sections obtained at 2 necropsies.

The first sections were from the thyroid gland of case 14, who died on May 25, 1954, six months after hypothyroidism was diagnosed. The cause of death was cor pulmonale, the precise ætiology of which was obscure, because the tuberculosis seemed insufficiently extensive to account for it. When hypothyroidism was diagnosed in November, 1953, he was given thyroid extract in small dosage (120 mg. daily for one week, 60 mg. daily for two months, no thyroid for one month, and 30 mg. daily until ten days before his death), and P.A.S. was continued without interruption until May 14, 1954. A further 3·1 kg. of P.A.S. had therefore been administered to him after the radioactive-iodine tests were completed, making a total of 10·6 kg. altogether. The thyroid was slightly enlarged and weighed 35·5 g. There was no nodularity and

a b

Fig. 5—Case 5 : *a*, with small goitre and mild hypothyroidism after 28 weeks' treatment with P.A.S. ; *b*, eleven weeks after substitution of isoniazid for P.A.S.

no significant external abnormality. On section it was difficult to make out acinar structure, and very little colloid was seen, but there appeared to be ample thyroid tissue. There was an increase in fibrous tissue in the form of very delicate strands, but no gross patches of fibrosis were seen. Microscopically the gland bore little resemblance to thyroid tissue (fig. 7). The acini were greatly distorted, and in many the epithelium had been desquamated. Where epithelium still lined acini it was heaped up into small papillary ingrowths and was obviously hyperplastic. There was a great increase in the vascularity of the gland, with the result that the epithelium was separated from the underlying connective tissue by large numbers of congested capillaries. There was practically no evidence of secretion, only a very occasional acinus containing a small quantity of colloid which was very pale when stained.

Further sections were studied from a patient, aged 57, with long-standing pulmonary tuberculosis who had had 5500 g. of P.A.S. in the twelve months ending in November, 1952. He died after a road accident in April, 1954. His thyroid weighed 36 g. and was diffusely enlarged, without nodularity. Histologically most of the epithelium was cuboidal or flattened, but there were numerous papillary infoldings in the acini, and the epithelium was occasionally columnar. These last two features indicated previous hyperplasia.

Discussion

Despite the fact that published cases of hypothroidism and goitre following the use of P.A.S. are few, it is clear that P.A.S. has a goitrogenic action that can be consistently demonstrated. Its anti-thyroid action, however, is slight, even in the large dosage customarily used, and a clinical effect does not become apparent in every patient. In our relatively limited experience the incidence of goitre and hypothyroidism appears to be appreciably greater than is generally estimated elsewhere. Edinburgh is not an area where goitre is common ; moreover, in the past we have not observed goitre in tuberculous patients. P.A.S. is undoubtedly unpleasant to take, and there is often a tendency to administer it in suitably coated tablets ; these, we have found, do not always give as effective blood-levels as are attained after P.A.S. is given in aqueous solution or in cachets, as is our habit to give them. This cannot, however, be the whole explanation of the surprisingly large proportion of cases of goitre and hypothyroidism observed, and we feel it unlikely that our criteria for the recognition of goitre are appreciably different from elsewhere. It is our impression that some of the most obvious goitres are found in adolescent patients, when the iodine requirement is relatively higher, and when any partial blockage of iodine utilisation might be more likely to lead to compensatory enlargement of the thyroid, but the ages of the patients in the non-goitrous group from the same hospital were quite comparable to those of the affected patients. Possibly an increasingly careful search for such cases among groups of patients receiving long-term treatment with P.A.S. would reveal further previously unsuspected cases of hypothyroidism or of goitre.

The blocking effect on the thyroid gland only persists so long as P.A.S. is being administered ; on withdrawal of P.A.S. any evidence of hypothyroidism usually disappears gradually and the goitre shrinks (fig. 5). This was not, however, invariably so, and a persistent goitre might be noted for many months. Our experience, in agreement with most other observers, including Brinkman and Coates (1954), is that the thyroid gland shrinks more rapidly when thyroid extract is administered (fig. 6), even if P.A.S. is still being given to the patient. This is to be expected in the case of a goitrous enlargement due to an

a b

Fig. 6—Case 11 : *a*, with goitre and hypothyroidism following 28 weeks' treatment with P.A.S. ; *b*, after 10 weeks' treatment with thyroid extract in addition to the P.A.S.

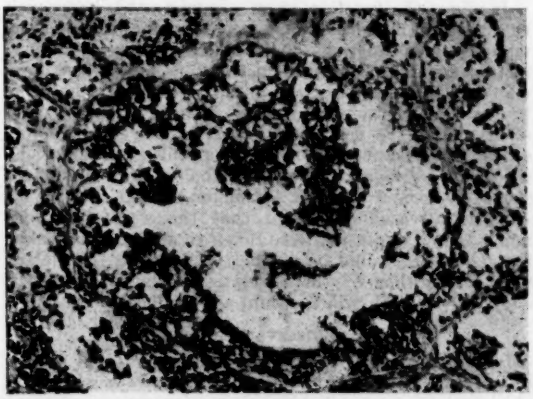

Fig. 7—Representative field from thyroid gland of case 14, who had received 10·6 kg. of P.A.S. in 79 weeks, showing hyperplasia and desquamation of epithelium, absence of colloid, excessive vascularity, and fine fibrosis (× 70.)

increased output of thyrotrophic hormone in response to a reduction in the level of endogenous thyroid hormone.

In 1 case, however (fig. 1 and table I, case 6), in which gross myxœdema had been noted during P.A.S. therapy, withdrawal of P.A.S. was not followed by any evidence of avidity of the thyroid for radio-iodine as was apparent in all the other cases. Possibly some irreversible, and perhaps permanent, changes had been produced in the thyroid gland by the long-continued administration of P.A.S., and the patient was subsequently treated with thyroid extract. Furthermore, the histological appearance of the thyroid gland of case 14 (fig. 7) six months after the radio-iodine tests had been made makes it probable that a repetition of the tests at that stage might well have shown a similar response to that of case 6, because the thyroid gland looked incapable of functioning normally.

Brinkman and Coates (1954) suggest that their findings do not confirm Librach's statement (1952) that the longer treatment is continued after the appearance of a thyroid swelling, the greater is the risk of clinical myxœdema developing. We believe that in our patients prolongation of treatment tended to increase the hypothyroidism. The cases already cited suggest that irreversible change may possibly be induced by very prolonged administration of P.A.S. It is significant that Beattie and Chambers (1953) report advanced degenerative changes in the thyroid gland of a rat which had received P.A.S. for 29 weeks, and they suggest that further administration of P.A.S. might have led to irreversible hypothyroidism. The histological appearances found in man (fig. 7) are not unlike those illustrated by Beattie and Chambers in a rat.

These same workers, however, report a response to P.A.S. in rats which differs from our observations in man and from those of Balint et al. (1954). They showed a depression of metabolism and radio-iodine uptake in rats receiving P.A.S. for short periods, but after 15 weeks on P.A.S. there was increased uptake of radio-iodine by the thyroid gland even while P.A.S. was being taken. After 29 weeks, however, the uptake of radio-iodine had decreased to the level of the control rats. These workers made all their observations on rats under treatment with P.A.S. They interpret these results as suggesting that after 15 weeks' treatment the early inhibition of iodide-concentrating power of the thyroid gland had been overcome, probably by the high level of circulating, thyrotrophic hormone produced.

There is no evidence that hypothyroidism antagonises the therapeutic effect of P.A.S. Although Fishberg (1932) and Rich (1946) cite evidence suggesting that thyroid underactivity increases susceptibility to tuberculosis, these observations have not been confirmed. Nash (1952), however, and one of us (A. G. M.) had some experience of this effect, and we do not believe it advantageous for tuberculous patients to remain in even a moderately hypothyroid state. If clinical hypothyroidism is recognised, either thyroxine or thyroid extract should be given in any event, and, if P.A.S. must still be used, the administration of thyroxine must be continued concurrently. Alternatively, isoniazid can be substituted for P.A.S. if this suits the planned régime of treatment, and thyroxine only given until a euthyroid state is produced. Our findings suggest that it is wise to give small doses of thyroxine to any patient who receives P.A.S. for longer than six months.

Neither our experience nor that of Brinkman and Coates (1954) supports the assertion by Balint et al. (1954) that the administration of iodide is sufficient to counteract the anti-thyroid effect of P.A.S.; nor did these workers show that iodide was efficacious while P.A.S. was still being given to their patients.

The precise mechanism of the action of P.A.S. is not yet determined. Rosenberg (1952) has shown that it is one of a group of substances that inhibit the peroxidase-enzyme mechanism, and such a peroxidase may well be present in the thyroid (Astwood 1949) and be concerned with the production of iodine from iodide, and its incorporation into the molecule of tyrosine, to form thyroid hormone. The observation of Brinkman and Coates (1954) and of ourselves that the administration of iodide to patients receiving P.A.S. had no effect on the goitres suggests that the mechanism of P.A.S. is not like that of thiocyanate, which prevents the concentration of iodide in the thyroid gland and has an effect which can be overcome, like that of perchlorate, with large doses of iodide. Probably the mode of action involved is concerned with the inhibition of iodine-binding rather than iodine-concentrating capacity, and P.A.S. would therefore be acting like the thiouracil group of goitrogens.

Pitt-Rivers (1950) has stated that the anti-thyroid action of a compound may be expressed as a function of its reducing power; but, as Arnott and Doniach (1952) point out, this cannot be sustained as the explanation in many cases, although P.A.S. has a well-marked reducing action (Horn and Bogsch 1950).

Summary

Of 83 tuberculous patients treated with sodium *p*-aminosalicylate for five months or more 20 developed a goitre, often with hypothyroidism, an incidence of 23%; 9 other cases were seen in other hospitals.

Studies with radioactive iodine showed changes in thyroid function in all the patients tested while receiving P.A.S. Many patients showed a hypothyroid pattern of radio-iodine excretion, and in all of them but 1 avidity of the thyroid gland for radio-iodine was observed on withdrawal of P.A.S.

Previously untreated patients showed a depression of thyroid function under treatment with P.A.S.

Although the goitrous and hypothyroid state induced by P.A.S. is usually quickly reversible on withdrawal of the drug, it is felt that thyroxine should be given to all patients in whom a goitre is noted, or to whom P.A.S. is to be given for more than six months.

Observations on 1 patient suggested that irreversible changes might be induced by prolonged use of P.A.S., and the histological appearances of the thyroid gland of a patient who had received more than 10 kg. of P.A.S. were those of extreme degeneration and disorganisation.

We are grateful to Prof. John Crofton and Prof. D. M. Dunlop for their encouragement and interest in this work; Dr. N. W. Horne, Dr. I. W. B. Grant, and Dr. J. D. Ross, who referred patients to us; Dr. J. A. Strong for the results of tests of radio-iodine excretion in 1952 in cases 1 and 2;

Dr. Bruce Cruickshank for fig. 7; and Mr. T. C. Dodds, F.R.P.S., for the clinical photographs. Part of the expenses was covered by a grant to one of us (A. G. M.) from the Secretary of State for Scotland through the Advisory Committee on Medical Research.

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THE NATURAL HISTORY AND MANAGEMENT OF HÆMOLYTIC TRANSFUSION REACTIONS

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IT is usually believed that hæmolytic transfusion reactions would be abolished were sufficient care lavished on grouping and cross-matching. This belief has been accepted by the general public and lawyers, who have tried (fortunately in vain) to persuade judges that death following a blood-transfusion is presumptive evidence of negligence on the part of a doctor or of the hospital authorities. The laboratory worker has unfortunately not protested vigorously against this belief and, faced with an incompatible transfusion, usually tries to forget it and his shame. Only those incompatibilities which cannot be overlooked—those inquired into by the coroner—remain in the conscious mind and thus exaggerate the dangers of incompatible transfusion.

Our legal system has laid it down that, in England hospital management committees are responsible for the professional acts of doctors working in their hospitals. It is not surprising, therefore, that attempts are made to lay down rules and regulations to prevent the doctors from making any mistakes. It would, of course, be much more satisfactory to ensure that laboratories are adequate, and that pathologists and technicians are sufficiently numerous and have been properly trained in blood-grouping methods, but this solution is expensive.

Rules couched in mandatory form have already been issued by some regional boards and hospital management committees. These rules safeguard the management committee and the average patient; but they are usually composed hurriedly under the threat of an action for malpractice, and make no provision for the occasional desperate emergency. For example, during a prostatectomy a patient might bleed excessively; and should the hospital blood-bank obey some of the rules which have been suggested, no blood might be available for two to three hours, during which the patient might well die.

It is not the function of an administrative body such as a regional board or a management committee to issue mandatory instructions on technical matters. No consultant should accept such instructions unless he knows who was the expert, or the group of experts, who drew up those instructions, and unless he has the opportunity of discussing the matter with that expert, should he so desire. In practice this means that rules or regulations issued by regional boards or management committees should be signed by their author or authors, not by an administrative officer; and that the wording should imply that if exception were taken to any of those rules, the consultant would be at liberty to discuss the matter with the author of the regulations, and if necessary adopt a variation which would satisfy local needs.

Observations

I have previously described (Discombe 1952) eleven hæmolytic transfusion reactions, and now, in the hope of providing more reliable information on the natural history of transfusion reactions, I add three more and review them all.

Case 14.—Mrs. Margaret X, aged 29, and Mrs. Peggy X, aged 49, were patients in the same ward; both needed transfusion but on successive days. Blood was cross-matched, labelled for Mrs. Margaret, and sent down to the ward. A few minutes later the technician, checking over the data once again, realised that the blood had been selected and cross-matched for Mrs. Peggy. About 5–10 ml. had by then been administered and caused a severe rigor.

Case 15.—A woman had given birth to a child with hæmolytic disease of the newborn; she had been found to be rhesus-negative and to possess anti-rhesus antibodies. She was later admitted for hysterectomy, and her surgeon was well aware of her blood status, which was recorded in her case-papers on this admission. After operation she continued to ooze blood; so the house-surgeon invited the resident pathologist to advise on transfusion. When the house-surgeon formally requested blood he omitted to record the patient's blood-groups on the request form. The resident pathologist grouped the patient as rhesus-positive and issued 500 ml. of rhesus-positive blood. There was no immediate reaction, but the patient became slightly jaundiced three days later, when the pre-transfusion cells were shown to be clearly rhesus-negative by the tube-albumin and saline-capillary techniques, and a weak agglutination with her undiluted pre-transfusion serum and donor cells in albumin was obtained.

I do not know how to guard against such accumulations of stupidity and technical error.

Case 16.—A man, aged 54, had a gastric ulcer. His blood was group B rhesus-negative, and at zero time he received two bottles of group-O rhesus-negative blood. He had a febrile shivering attack (T. 103·6°F). In the subsequent 24-hour periods his urinary output was 0, 0, 445, 310, 710, and 1480 ml., the first specimen being reddish but containing no hæm pigments. After 18 hours the van den Bergh direct reaction was positive (30 seconds) but the total bilirubin was only 0·8 mg. per 100 ml. He was placed on the Borst-Bull régime ab initio. Subsequent studies showed that the recipient's serum contained no antibodies to the donor cells, and that the highest donor anti-B titre was 256 in saline solution and 512 in albumin against the recipient's cells, but no hæmolysin could be demonstrated.

One is reluctant to ascribe the hæmolytic reaction to an antibody of this type, but there seems to be no other reasonable explanation.

Clinical Commentary

Thus, of 14 examples of hæmolytic transfusion reaction 3 had no discoverable cause, 4 were due to administrative mistakes, 6 were due to laboratory or technical error, and 1 was apparently due to donor antibodies.

There was 1 death among the 3 cases which had no discoverable cause (mortality 8%); there was 1 case of anuria. The incidence of reactions without apparent cause is about 1 in 2300 transfusions, or 1 in 5000 bottles transfused, and of avoidable reactions about 1 in 800,

EFFECTS OF INCOMPATIBLE BLOOD-TRANSFUSIONS

Case no.	Volume of incompatible blood (ml.)	Pain in back	Rigor	Pyrexia	Dyspnœa	Diarrhœa or belly-ache	Hypotension	Fits or coma	Hæmoglobinuria	Jaundice	Oliguria
1	1250	0	0	0	0	0	0	0	0	0	0
2	150	+	+	+	0	0	0	0	+	0	0
3	250	+	+	+	0	0	0	0	+	0	0
4	1250	0	0	0	0	0	0	0	+	+	0
5	500	+	+	+	0	0	0	0	+	0	0
6	250	0	+	+	0	+	0	0	+	0	0
7	500	0	0	0	0	0	0	0	0	0	0
8	400	0	+	?	?	0	0	0	+	0	0
9	15	+	0	+	+	+	+	+	0	0	0
10	250	+	+	+	+	0	0	0	+	0	0
12	1000	+	+	+	+	+	+	+	+	+	+
14	10	0	+	+	0	0	0	0	0	0	0
15	500	0	0	0	0	0	0	0	0	+	0
16	—	0	+	+	0	0	0	0	0	+	+

Cases 1–8 are ABO incompatibilities; case 15 a rhesus-incompatibility; cases 9, 10, and 12 had no demonstrable cause; and case 16 was due to donor antibodies.

or 1 in 1760 bottles transfused—an appreciable improvement over my previous report.

The most surprising quality of 10 reactions due to incompatible transfusions which had a demonstrable serological cause has been their mildness. Wiener (1943) and Mollison (1951) agree that, not infrequently, symptoms are so mild that they pass unnoticed or are attributed to other causes. Whitby and Britton (1953) state: "Rapid death . . . or a prolonged and serious illness may follow the transfusion of as little as 50 ml. of incompatible blood. On the other hand, large volumes are sometimes tolerated with little or no reaction."

My own experience is summarised in the accompanying table: of 9 ABO incompatibilities 8 involved 150 ml. or more of incompatible blood, and symptoms were mild; 1 rhesus incompatibility produced mild symptoms, but the 3 patients in whom no serologic error could be detected all had severe symptoms, and 1 died. This experience is not unique. Cannon (1953), Shackle (1953), and Pinkerton (1953) each describe a severe hæmolytic transfusion reaction in which no serological cause could be demonstrated, and Pinkerton's patient died. A death at Southend followed the administration of serologically compatible blood; the coroner's pathologist undertook necropsy on the fifth day after death and ascribed death to the administration of infected blood; but the bacteria recovered from the patient differed from the very few recovered from the donor blood, which had stood uncapped for a few hours after the transfusion had been stopped. It seems possible that this was another example of an unpredictable reaction (Webb and anr. *v.* Southend Group Hospital Management Committee and anr., Queen's Bench Division, Mr. Justice Hilbery, November, 1953).

Excretion of Hæmoglobin

The mechanism by which an incompatible transfusion kills a patient is still obscure. The hypothesis that anuria is caused by obstruction of the renal tubules by hæmatin casts can be traced back to the work of Werner (1911), Barratt and Yorke (1909), and Yorke and Nauss (1911) on blackwater fever, the last-named showing that rabbits receiving a dry diet developed anuria, whereas those receiving greenstuffs did not. Baker and Dodds (1925) confirmed this work, showing that in rabbits a dry diet produced an acid, and a green diet an alkaline, urine. This observation led to the idea that a forced diuresis of alkaline urine should prevent or even cure anuria, and is offered as justification for the treatments with sodium sulphate, lactate, or bicarbonate which have been advocated.

DeGowin et al. (1937), working with dogs, obtained results similar to those of previous workers with rabbits, but DeGowin et al. (1938) considered that tubular necrosis was a major factor in causing anuria, as did De Haan (1905) in his study of blackwater fever.

Young et al. (1949) and Yuile et al. (1949) obtained quite different results; their eight dogs each received up to four incompatible transfusions without being seriously inconvenienced; none developed oliguria or even significant retention of nitrogen, irrespective of the reaction of the urine. My own series of 14 hæmolytic transfusion reactions shows that my patients reacted much more like Yuile's dogs than like Yorke's rabbits. Yuile's suggestion that oliguria develops only when there is pre-existing renal damage seems soundly based.

Histology of Incompatible Transfusion

Fatal cases show the renal changes of the crush syndrome, indistinguishable from those described by Hackradt (1917), Minami (1923), Bywaters and Dible (1942), and Lucké (1946). The changes are essentially (1) stromal œdema with cellular infiltration, (2) necrosis of the epithelium of the ascending limb of Henle and of the distal convoluted tubules, (3) tubulovenous anastomoses, and (4) formation of hæm-pigment casts. In the few cases where lesions of other organs have been sought stromal œdema has been constant (Bordley 1931, Goldring and Graef 1936, Dardinski 1945, Diligio and Hochwald 1949).

The renal changes are shared by a bewildering number of other diseases—e.g., alkalosis (McLetchie 1943), septic abortion (Bratton 1941), hydronephrosis (Bywaters 1945), carbon-tetrachloride poisoning (Woods 1946), quinine poisoning during the first trimester of pregnancy (Vartan and Discombe 1940, sections reviewed by Discombe 1954), and the bite of South American rattlesnakes (Amorim and de Mello 1954).

The interpretation of these abnormalities is difficult; the œdema suggests widespread increase in capillary permeability; but there is no obvious reason why so sharply defined a zone of tubular epithelium should undergo necrosis. The tubulovenous anastomoses were first thought to be caused by herniation of the basement membrane into the peritubular venules and subsequent rupture (Dunn et al. 1941). It is usually thought that the concentrated glomerular filtrate is restored to the blood-stream through these anastomoses, but Woods (1946) suggests the reverse:

"in the crush syndrome there is a shunting of the renal circulation from the cortex to the medulla. . . . The blood is thus diverted into the vasa recta which form the arteriovenous anastomoses. As the result the cortex suffers anoxia and the medullary vessels are greatly engorged. It may follow that the sudden altering of the relative pressures in the veins and tubules in the medulla leads to rupture where the walls of these structures are in close apposition, with the entry of blood into the lumina of the tubules."

This hypothesis certainly seems to fit the facts and makes it much easier to understand why patient A dying within 12 hours may have no casts, whereas patient B dying on the 8th or 10th day may have many tubules distended by casts formed from obvious red cells or brown granular debris. Even though there is this engorgement of the medulla, it is difficult to understand why the tubular epithelium should show such sharply defined necrosis.

Fatal Reactions

However, although some patients die with anuria or oliguria, this is rarely the most dramatic part of the picture. The patient who is likely to die sweats, shivers, may vomit or have diarrhœa, may develop respiratory embarrassment, and does develop severe hypotension; there may be fits or convulsive attacks (Robinson 1941).

These symptoms and signs are quite different from the simple rigor, fever, lumbar pain, and hæmoglobinuria of the ordinary hæmolytic reaction and resemble much more closely an anaphylactic reaction. Is it possible that the fatal transfusion reactions are caused by some allergic response independent of the relatively benign hæmolysis?

This hypothesis is in agreement with the clinical observations but appears to conflict with the histological picture. The histology suggests a generalised increase of permeability of the capillaries, producing œdema, not perhaps incompatible with the allergic hypothesis; but it still seems difficult to explain the tubular necrosis. However, West et al. (1953), in a study of hæmoglobin as an antigen, noted that in shocked guineapigs the proximal convoluted tubules were normal, whereas the more distal tubules were dilated, and Longcope and Rackemann (1917) noted retention of nitrogen, proteinuria, and cylinduria during attacks of urticaria caused by the ingestion of beef by a patient hypersensitive to beef. Therefore the kidney may respond as a "shock organ" to some allergic stimuli.

Were the hypothesis of an allergic reaction to be accepted, one would expect that intravascular hæmolysis of a patient's own blood would rarely, if ever, cause the symptoms seen in incompatible transfusion, but that heterologous blood, or autogenous blood modified by some foreign haptene, might do so. This is in fact the case, for the paroxysmal hæmoglobinurias never cause the "allergic" type of reaction, and Moeller (1954) has noted the destruction of about 2000 ml. of a patient's red cells without significant renal damage. Terplan and Javert (1936) and Vartan and Discombe (1940), however, noted all the symptoms and signs of an incompatible transfusion after the administration of quinine to women in the first trimester of pregnancy. Quinine is well known as a cause of purpura and other skin eruptions (Dawson and Garbade 1930, 1931), as well as a precipitating factor in blackwater fever. It therefore seems reasonable to suppose that the quinine may combine with body protein to form a foreign antigen.

One is thus led to the following hypothesis: the excretion of hæmoglobin per se is virtually innocuous; most patients subjected to a hæmolytic transfusion reaction are little inconvenienced and are unlikely to develop anuria, however much incompatible blood they receive; a few patients with previously damaged kidneys or with some biochemical disorder which impairs renal function (dehydration, alkalosis) may develop anuria without shock or hypotension and may die; and a very few (almost certainly fewer than 1 in 10) will show an allergic response, develop hypotension and oliguria or anuria, and die perhaps within a few hours, perhaps in the course of days (Diligio and Hochwald 1949, Discombe 1952, case 12). Allergic responses may, of course, be based on *some antigen-antibody system other than the blood-group system* and would then be "without discoverable cause" or caused by some constituent of the plasma, as were the relatively mild ones described by Dameshek and Neber (1950). This view is similar to that of the Leningrad school, summarised by Hesse (1936) and Bodley Scott (1949).

Treatment of Hæmolytic Transfusion Reactions

If this hypothesis be accepted, the correct treatment of "ordinary" hæmolytic transfusion reactions is conservative—i.e., a hæmolytic transfusion reaction does not necessitate any departure from the normal treatment of the underlying disease. There are still some workers who advocate the administration of sodium-sulphate or of sodium-lactate solutions in the "first stage" of shock and hypotension, which is said to last but a few hours. ***This stage is usually absent, and in the absence of shock and hypotension there is no indication for any such treatment.***

In the rare cases in which significant circulatory collapse—the "first stage" of shock and hypotension—may develop there is equally no indication for the use of either of these substances, because the administration of sodium sulphate in the quantities usually recommended disturbs the ionic equilibrium of the body and produces cellular dehydration, which impairs the efficiency of every organ.

The standard textbook of Whitby and Britton (1953) suggests that during the first 12 hours an attempt should be made to induce diuresis by the intravenous injection within a period of an hour of a litre of 4·3% sodium sulphate or of 1·8% sodium lactate. It is interesting to calculate the ionic changes in the body which result from such administration. A litre of 4·3% sodium-sulphate solution contains 606 m.eq., equivalent to 35·5 g. of sodium chloride. From past experience (Bartlett et al. 1938) we know that 0·5 g. of sodium chloride per kg. of body-weight will raise the plasma-chloride level by 100 mg. per 100 ml.—about a sixth. If we make the reasonable assumption that changes in chloride are paralleled by changes in sodium, in a person weighing 70 kg., 1000 ml. of 4·3% sodium-sulphate solution would raise the plasma-sodium level by about a sixth, 25 m.eq. per litre. The normal plasma-sodium level being 145 ± 5 m.eq. per litre, the infusion would raise a low normal plasma-sodium level (140) to a grossly supranormal level (165 m.eq.). Besides causing this sudden rise in the plasma-sodium level the infusion introduces about 25 m.eq. per litre of SO_4" ion, the normal level of which is 0·1–0·2 m.eq. per litre. It necessarily follows that water will be withdrawn from the cells to restore the ionic equilibrium; and, if the patient is already dehydrated, the cells will become more so. If the patient is not dehydrated, the administration of sodium sulphate will produce a fairly severe cellular dehydration, which may well lead to impairment in renal function.

The administration of sodium lactate in the recommended quantities leads to a rise of only 6 or 7 m.eq. per litre of sodium; but, since the lactate ion is burnt completely to carbon dioxide, an equivalent rise in the plasma-bicarbonate level may be expected. Again, since the normal plasma-bicarbonate level is 29 ± 5 m.eq. per litre, the average patient will be thrust immediately into alkalosis, a condition which is injurious to the kidneys and, if maintained, causes retention of nitrogen and even tubular necrosis.

Since we have had 10 incompatible transfusions in which 150–1250 ml. of ABO or rhesus-incompatible blood has been administered, it is possible to calculate the most probable frequency of anuria or of death (Fisher and Yates 1948). The frequency with which anuria may be expected to develop is about 7%. It thus seems somewhat illogical immediately to start active treatment of a condition which, if left alone, will show spontaneous recovery in about 14 patients out of 15. It may be maintained that it is only in the few patients with shock and circulatory collapse that the administration of these salt solutions is needed, but there are equally cogent reasons why their use in shock should be regarded as illogical. First, sodium, sulphate, and lactate ions pass readily through the capillary walls and therefore, if administered to a patient with hypotension, will pass out into the tissue without retaining fluid in the circulatory system. Colloids, such as blood-plasma, blood, and dextran, will certainly remain within the circulatory system, but in the few cases—e.g., Discombe's (1952) case 12, and Diligio and Hochwald's (1949) case 1—which have been recorded in any detail administration of blood or of plasma had little or no beneficial effect.

It seems that the primary lesion is in the vascular tree, and that the capillaries, arterioles, and venules form a container which can undergo passive dilatation when suitable fluids are injected but no longer provides the resilience needed to maintain normal circulation. The logical treatment must therefore be directed to restoring the natural resilience of the vascular system, and in the present state of our knowledge it seems that this might be done most satisfactorily with pressor drugs which act

directly on the vessel wall and raise the blood-pressure. Of those which have undergone fairly extensive clinical trials, the most suitable seem to be noradrenaline and methylamphetamine hydrochloride. Noradrenaline raises the systolic and diastolic pressures by peripheral vasoconstriction, which affects also the vessels of the kidney; hence a slow drip containing noradrenaline should restore the blood-pressure and the pressure differential at the glomerulus and thus facilitate filtration. Methylamphetamine hydrochloride also causes vasoconstriction, but to a less degree in the kidneys than in other tissues; hence with this drug a larger proportion of the circulating blood may be expected to pass through the kidney, although the pressure differential across the glomerulus may be smaller. In addition, it might be profitable to administer an anti-histamine drug.

The incidence of incompatible transfusions is fairly low, and the incidence of hæmolytic shock with circulatory collapse is even lower; hence it is quite possible that one may wait for years without seeing such a case. Nevertheless, the mortality when such a condition develops is extremely high, and I suggest that treatment with noradrenaline or with methylamphetamine hydrochloride would be the most logical and promising treatment, the drug being administered by a slow intravenous drip in a solution not containing any crystalloid ions—e.g., in 6% dextrose in water—and the administration of an anti-histamine should be considered.

Should some unfortunate patient develop anuria because of pre-existing renal damage or from tubular necrosis, the Bull-Borst régime (Borst 1948, Bull et al. 1949) offers an excellent chance of recovery to patients who have not received biochemical insults of sodium sulphate or of sodium lactate; but the combination of Bull's emulsion of peanut-oil and glucose with a slow intravenous drip of noradrenaline will be difficult to administer within the strict limits of fluid intake which are permissible. Even so, one may go so far as to say that, in the absence of some independent complication such as pre-existing renal damage, patients whose blood-pressure does not fall catastrophically should not die if they are subjected to the Bull-Borst régime as soon as they are found to be anuric.

Summary

Incompatible transfusion is less dangerous than is generally believed.

Most patients subjected to an incompatible transfusion recover spontaneously if their kidneys have not been previously damaged and if they are not subjected to biochemical insults. Anuria is rare and best treated by the Bull-Borst régime.

Should hypotension and shock persist, it appears reasonable to try the effect of pressor drugs.

The issue of advisory circulars by anonymous "advisory" bodies is deprecated because departure from the advised procedures might be regarded as evidence of negligence, whereas many equally reliable alternative procedures may exist. Advisory circulars should be signed by their authors.

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ABNORMAL GLUCOSE-TOLERANCE TESTS IN PATIENTS TREATED WITH SEDATIVE DRUGS*

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OUR attention was directed to this problem when we found that unrecognised barbiturate addicts had been investigated for islet-cell tumour of the pancreas because of episodes of anxiety, confusion, and clouded consciousness. In some of them at one time or another abnormalities of carbohydrate metabolism were found (Hunter and Greenberg 1954).

Material

We report here the results of glucose-tolerance tests on an unselected series of 16 patients when taking large doses of sedatives (see table I). 3 of these patients were on continuous narcosis, mainly with barbiturates. Of the others, 9 were established barbiturate addicts, and 5 of these had been receiving barbiturates from their own doctors and other sources for some time; these patients we call habituated. Most of the barbiturates used were medium-to-short-acting ones, such as amylobarbitone sodium, quinalbarbitone sodium, and pentobarbitone sodium. The dose varied from gr. 1 1/2 to gr. 32 in twenty-four hours. Some of the patients were having chloral gr. 60 a day, tab. codein. co. up to four a day, or paraldehyde up to 6 drachms a day; 2 were on chlorpromazine ('Largactil') and promethazine hydrochloride ('Phenergan'), and 1 on morphine gr. 6 daily.

Twenty-three two-and-a-half-hour glucose-tolerance tests have been done, and blood-sugar estimations continued at half-hourly intervals for a further two and a half hours.

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TABLE I—DRUG DOSAGE *

Case no.	Phenobarbitone	Amylobarbitone sod.	Quinalbarbitone sod.	Pentobarbitone sod.	Paraldehyde	Chloral hydrate	Duration and other drugs
1	..	4·5	6	..	..	..	4 yr.
2	..	..	9	..	..	..	3 mos.
3	..	6–10	..	..	..	..	7 mos.
4	..	24	..	..	4	..	9 days before test *a* (see fig.)
	..	3	..	..	..	30	7 days before test *b* (see fig.)
5	..	3–6	..	..	..	..	At least 2 yr.
6	..	12	..	..	..	..	4 mos.
7	..	..	10–30	..	..	..	At least 2 yr.
8	..	4	6	3	..	..	Amylobarbitone sod. gr. 6 for at least 6 mos. before admission. 7 days before test *a* (see fig.)
	..	..	..	..	..	45	Plus promethazine hydrochl. 75 mg. and chlorpromazine 75 mg. daily for 18 days before test *b* (see fig.)
9	3	..	..	3	..	..	10 yr. Plus pethidine 300 mg. daily for 14 days before test *b* (see fig.)
	..	32	..	..	6	..	10 days before test *a* (see fig.)
10	..	..	9–15	..	..	..	3 yr.
11	..	12–15	..	..	..	..	About 5 yr. Chlorpromazine 200 mg. for 14 days
12	..	3–9	..	..	..	..	At least 2 yr. Also alcoholic. Plus paraldehyde 10 drachms through period of test
13	..	..	..	6	..	30	Plus morphine gr. 6 for 2 yr.
14	..	6–9	..	..	..	..	About 18 mos.
15	..	..	4·5	4·5	..	30	6 mos. to time of test *a*. No drugs for 4 days before test *b* when she had delirium tremens
	..	..	..	4·5	..	30–45	10 days before test *c*
16	24	..	..	..	..	90	7 days before test *a*
	1·5	..	..	..	..	30	Gradual diminution to test-*b* dosage 20 days later

* Paraldehyde drachms per day : all others grains per day.

Methods

Glucose-tolerance tests were done for five-hour periods after the patient had taken by mouth glucose 50 g. in 180 ml. of water. The capillary-blood-sugar level was estimated at half-hourly intervals by the method of Haslewood and Strookman (1939), which estimates "true" sugar. Urine specimens were tested whenever available. At no time were glucose or ketone bodies detected.

Table II shows the normal range for the two-and-a-half-hour glucose-tolerance test by this method. It is derived from tests made on 23 healthy men and women. This range is calculated from the mean of the observations for each period plus or minus twice the standard deviation. The terms "hyperglycæmic" and "hypoglycæmic" are here applied to all levels of blood-sugar which were found to be above or below the limits of the range established in those healthy people within the first two and a half hours.

Results

Comparing the results in the first two and a half hours in our patients (table III) with this normal range, we find that the curves fall into four groups: (1) "lag" curves, 4; (2) prolonged hyperglycæmic curves, 7; (3) hypoglycæmic curves, 7; (4) bizarre curves, 5.

The accompanying figure shows the results in 7 cases where more than one test was done. It compares the results when the patients were on heavy barbiturate medication or continuous narcosis, with those when the patients were on diminished dosage or no drugs at all.

The tests recorded in the figure for cases 2, 4, 8, 9, and 16 were done (*a*) while the patient was on heavy dosage, and (*b*) while the patient was on milder dosage.

TABLE II—NORMAL RANGE FOR GLUCOSE TOLERANCE OF 23 HEALTHY ADULTS, TESTED BY METHOD OF HASLEWOOD AND STROOKMAN

Specimen	Blood-sugar (mg. per 100 ml.)	
	Mean	Range
Fasting	91·3 (S.D. 9·7)	110·7 – 71·9
½ hr. after glucose..	132·3 (S.D. 19·8)	171·9 – 92·7
1 hr. ,, ,, ..	106·7 (S.D. 13·9)	134·5 – 78·9
1½ hr. ,, ,, ..	93·1 (S.D. 14·9)	122·9 – 63·3
2 hr. ,, ,, ..	83·7 (S.D. 9·9)	102·5 – 63·9
2½ hr. ,, ,, ..	82·3 (S.D. 5·3)	92·9 – 71·7

Case 2 was thought cured of her addiction when the second test was made, but she later confessed to having obtained and taken barbiturates from outside sources before the test.

Case 4 had generalised neurodermatitis.

Case 9 was an addict who at the first test was on continuous narcosis and at the second was back on his usual dosage.

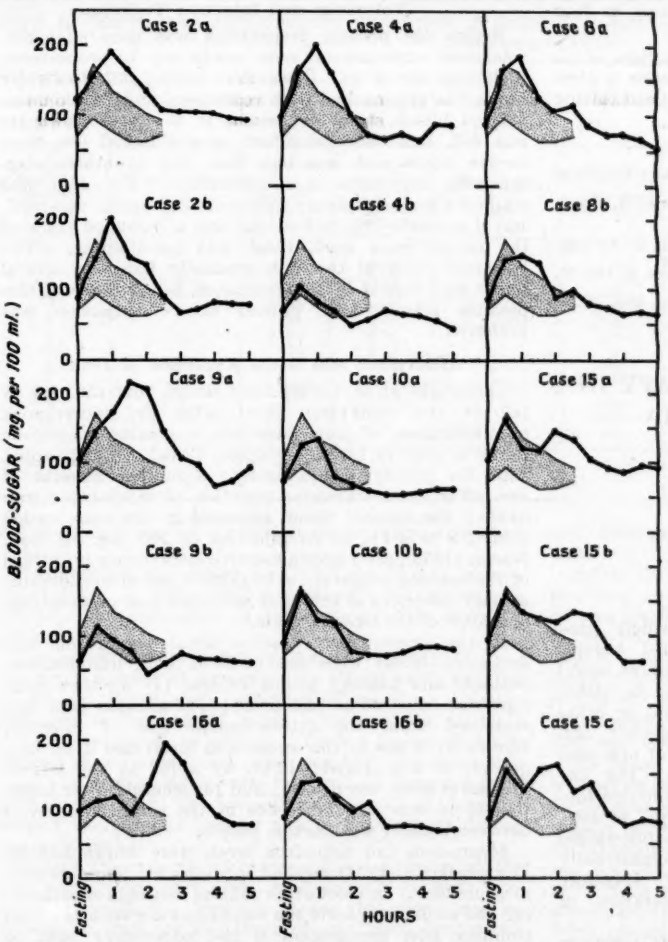
Case 16 was on continuous narcosis at the first test and on minimal dosage at the second test a fortnight later.

TABLE III—GLUCOSE-TOLERANCE TESTS ON PATIENTS RECEIVING SEDATIVE DRUGS

Type of curve	Case no.	Remarks	Blood-sugar (mg. per 100 ml.)										
			Fasting	½ hr.	1 hr.	1½ hr.	2 hr.	2½ hr.	3 hr.	3½ hr.	4 hr.	4½ hr.	5 hr.
"Lag"	1	H	91	166	171	168	104	88	83	93·5	67	69	77·5
	2	A	90	148	203	148	138	90	69	77	88	81	81
	3	H	90	137	144	181	153	84	85	70	63	76	76
	4	C.N.	98	157	200	157	102	73	68	73	65	84	84
Prolonged hyperglycæmic	5	H	83	136	158	164	147	122	92	81	61	64	58
	6	H	81	154	173	178	143	104	106	115	92	78	78
	7	A	76	108	152	150	124	122	62	62	67	67	67
	8	H	87	163	185	127	109	113	82	73	73	67	53
	8	H	83	145	148	139	89	98	80	76	65	69	65
	2	A	128	156	192	164	136	108	106	104	102	98	92
	9	A on C.N.	103	148	171	216	205	143	108	97	66	74	97
Hypoglycæmic	9	A off C.N.	62	113	94	70	46	59	71	67	67	59	59
	10	A	76	125	133	78	67	60	56	56	58	62	62
	11	A	86	111	133	92	74	60	60	74	75	76	83
	4	Off C.N.	73·5	106	83	73·5	50·5	60	71	69	64·5	57·5	48
	12	A	66	117	120	115	78	51	49	51	56	56	56
	13	A	66	73	117	83	61	78	83	46·5	41·5	41·5	44
	14	A	78	142	118	55	50	58	60	60	63	68	70
Bizarre	15	A	91	160	133	125	120	133	128	83	61·5	61·5	69
	15	A	104	164	122	118	145	133	104	92	85	97	92
	15	A	88	157	129	155	163	125	137	92	76	84	80
	16	C.N.	99	112	119	97	134	194	167	117	90	79	79
	16	Off C.N.	87	135	139	117	98	109	72	72	72	69	69

A = Addicted. C.N. = Continuous narcosis. H = Habituated.

Case 13 was on morphine gr. 6 a day, as well as barbiturates.
Cases 2, 4, 8, 9, 10, 15, and 16 are referred to in the text and figure.



Serial glucose-tolerance tests in 7 cases. Shaded areas represent normal range.

In case 10 the first test was done while the patient was on heavy dosage. All drugs had been discontinued three weeks before the second test. This was the only normal result obtained, and it is not shown in table II.

Case 15 was severely addicted, and the second test was taken ten days later while she had delirium tremens, due to total withdrawal of drugs. The third test was done when she had been put back on barbiturates in diminished dosage.

Discussion

We have described these results partly because one of us has always regarded the glucose-tolerance test—despite its apparent simplicity—as one of the most difficult laboratory tests to interpret, by reason of the many variables to which it is subject.

Abnormalities of the glucose-tolerance test in psychiatric patients have been reported (Altschule 1953); but these are inconstant, and, as far as we know, no allowance has been made for the possible influence of sedative medication.

"*Lag*" *Curves and Hyperglycæmic Responses*

Ross (1918) found that morphine caused hyperglycæmia; but in this series the most distinct hypoglycæmia was in the only patient addicted to morphine as well as barbiturates (case 13).

Underhill and Sprunt (1927) suggested that barbiturates also caused hyperglycæmia, and this was substantiated by the work of Quastel and Wheatley (1932) on the effect of narcotics *on the enzyme systems mediating the* oxidation of glucose by the brain, heart, and liver. Narcotics, particularly barbiturates, were shown to inhibit the enzyme system concerned with the oxidation of *glucose in these organs, and it seems* probable that some of the hyperglycæmic responses we have observed can be accounted for in this way. Hyperglycæmic responses are also found in chronic alcoholics (Bowman et al. 1939).

The possibility that endocrine factors are responsible for the hyperglycæmic responses which we found must be considered. Hyperglycæmic responses occur in patients with hyperthyroidism (Geyelin 1915) and Cushing's syndrome (Allbright 1942–43).

Another possibility is that these responses may be due to accelerated absorption of glucose from the alimentary tract.

Malnutrition or insufficient carbohydrate intake cannot account for our results, because all the patients, including those on continuous narcosis, had been on a full mixed hospital diet for at least a week before their tests, and none was in poor physical condition.

Hypoglycæmia

The curves showing hypoglycæmia are of interest in the light of the suggestion by Hunter and Greenberg (1954) that barbiturate addiction should be considered differential diagnosis of islet-cell adenoma of the pancreas.

In the present series 3 patients had fasting blood-sugar levels below the lower limit of normal. 1 patient was hypoglycæmic at half an hour, 1 was hypoglycæmic at one hour, 1 was hypoglycæmic at one and a half hours, 4 were hypoglycæmic at two hours, and 6 of these 7 were hypoglycæmic at two and a half hours. Since the range of the curves from our healthy subjects presumably takes account of "alimentary hypoglycæmia," we consider that these findings in our patients are unlikely to be physiological or to have occurred by chance. Cases 12 and 13 (table III) had symptoms of hypoglycæmia during the last two hours of the five-hour period.

Bizarre Responses

We are unable to account for these.

Conclusion

We cannot offer any final explanation for the abnormalities we have found, but the various possibilities are being investigated. Our results suggest, however, that barbiturate medication must always be considered as a possible cause of abnormality in the glucose-tolerance test. We specify barbiturates because these are now by far the commonest of all drugs prescribed today, but other sedative drugs may have the same effect. Not only do barbiturates independently interfere with appetite—an effect more pronounced when these are combined with amphetamine—but their direct effects on glucose utilisation seem to call for careful reconsideration of insulin dosage during barbiturate medication of diabetics.

Summary

Glucose-tolerance tests on 16 patients who were receiving sedatives, mainly barbiturates, revealed abnormalities in all.

Such abnormalities may persist for as long as four weeks.

We thank Dr. T. A. Munro and Dr. D. Stafford-Clark, of the York Clinic, Guy's Hospital, for allowing us access to their patients; and Mrs. D. Hudson for technical help and making the figure.

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INTRAMUSCULAR IRON THERAPY IN IRON-DEFICIENCY ANÆMIA

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INTRAVENOUS iron therapy has been widely used since Nissim (1947) first successfully treated anæmic patients with saccharated iron oxide, and is most useful in patients refractory to oral iron owing to either malabsorption (Badenoch and Callender 1954) or other factors, such as rheumatoid arthritis (Sinclair and Duthie 1949). Patients who are intolerant of oral iron usually respond well to intravenous iron. The disadvantage of this form of therapy has been the development of reactions either early, due to allergy, or late, due to intravascular precipitations of the administered iron (Nissim 1954). This latter reaction is occasionally fatal (Librach 1953, Barritt and Swain 1953); therefore an alternative and less hazardous preparation of parenteral iron is desirable.

Claude Bernard (1848) was the first to use intravenous iron in animals, but it was not till much later that the therapeutic difficulties of giving parenteral iron were studied, and Stockman (1893) treated three cases of chlorosis successfully with subcutaneous injections of "iron and sodium in water," but reached a total dose of only gr. 12 of iron daily; any further increase caused intense pain. Brownlee et al. (1942) administered various iron preparations into the muscles of rabbits and found that the degree of muscle necrosis varied inversely with the degree of absorption—i.e., the better the preparation was absorbed the less necrosis followed. These workers found that the best absorption was obtained with injections of iron triethanolamine. Later workers—e.g., Slack and Wilkinson (1949)—could not confirm this and found that similar intramuscular preparations were effective but proved too painful for routine use.

An intramuscular iron preparation has been studied in the present investigation as regards tolerance, absorption, hæmatological response, and reactions. This dextran-iron solution, prepared by Messrs. Bengers Ltd., has the following characteristics (Fletcher and London 1954):

(1) It is about a third as toxic as iron saccharate solution to mice.

(2) It is more stable than iron saccharate both in vitro and in vivo.

(3) It does not precipitate in plasma over a wide pH range.

(4) It has a pH of 6·0–7·0, is isotonic with tissue fluids, and contains the equivalent of 5% of iron.

Tolerance and Injection Technique

Before the present preparation was used clinically, tolerance experiments were made on 10 volunteers, including one of us. Discomfort lasting four to twelve hours was experienced by 8 volunteers, and the skin was stained bluish, black, or brown in 2. No severe pain was felt, and the discomfort usually lasted less than twelve hours and was like that due to other intramuscular injections—e.g., penicillin. The skin was stained when an ordinary intramuscular needle was used, but if a needle $2^1/_2$ inches long and a Z-shaped track of the needle were used, there was no staining. The brownish stain of the skin gradually faded in several weeks and was of little significance, but because of this possible staining the gluteal site of injection was preferred.

Absorption and Renal Excretion of Iron

Cartwright et al. (1948) have shown that the rate of fall of the serum-iron level after the intravenous administration of iron ascorbate is greater in anæmic patients than in healthy people. Crawley (1952) noted that the kidneys could excrete a limited amount of iron after the intravenous injection of saccharated iron oxide; the amount which appeared in the urine varied from 2·9 to 4·4% of an injection of 200 mg. of iron. Nissim (1953), after giving massive intravenous injections of various iron preparations to rabbits, noted considerable urinary excretion of the more diffusible iron preparations and little of the less diffusible.

In the present investigation serial serum-iron and urine-iron levels were estimated in both iron-deficient patients and healthy people to find (1) whether more iron was excreted in the urine; (2) whether iron was mobilised from the intramuscular site of injection (shown by a rise in the serum-iron level) and if so, how quickly it was stored (shown by a fall in the serum-iron level after the peak); and (3) whether after injection there was any difference in the serum-iron levels between healthy and anæmic people.

Serum-iron and urine-iron levels were determined by Fowweather's (1934) method modified for photo-electric measurement. In most other routine methods of estimating the serum-iron level the conditions are such that the complex iron preparation is not completely split to allow all the iron present to react. The present method estimates all the iron in the serum; so all possible precautions were taken to prevent hæmolysis. Specimens of sera showing any hæmolysis were discarded. In the case of the present preparation of iron no difference was detected between the iron content of the serum and that

TABLE I—SERUM-IRON AND URINARY EXCRETION OF IRON AFTER ONE INTRAMUSCULAR DOSE OF 250 MG. OF IRON (5 ML. OF THE PREPARATION)

Subject	Volunteer		Case 1		Case 2		Case 3	
Initial Hb	92%		76%		60%		55%	
Days after I.M. injection of 250 mg. of iron	Serum-iron (µg. per 100 ml.)	Urinary excretion of iron (mg. per 24 hr.)	Serum-iron (µg. per 100 ml.)	Urinary excretion of iron (mg. per 24 hr.)	Serum-iron (µg. per 100 ml.)	Urinary excretion of iron (mg. per 24 hr.)	Serum-iron (µg. per 100 ml.)	Urinary excretion of iron (mg. per 24 hr.)
−2	..	..	..	..	..	..	..	0·21
−1	115	0·18	90	0·07	70	0·16	..	0·20
0	..	..	..	0·16	..	0·22	..	0·43
1	700	0·20	1230	0·11	390	0·08	1960	0·13
2	970	0·13	..	0·15	920	0·11	1790	0·19
3	760	0·19	1160	..	1000	0·15	1150	0·15
4	590	0·20	860	0·31	600	0·10	770	0·14
5	480	0·17	430	0·20	455	0·19	360	0·18
6	370	0·12	235	0·13	180	..	..	0·15
7	265	0·14	180	0·15	..	0·15	110	0·10
8	..	0·20	..	0·16	..	0·19	..	..

TABLE II—SERUM-IRON AND URINARY EXCRETION OF IRON IN PATIENTS RECEIVING THERAPEUTIC DOSES OF IRON INTRAMUSCULARLY

Case no.	4			5			6		
Initial Hb	58%			42%			57%		
Days after first I.M. injection of iron	Dose of I.M. iron (g.)	Serum-iron (µg. per 100 ml.)	Urinary excretion of iron (mg. per 24 hr.)	Dose of I.M. iron (g.)	Serum-iron (µg. per 100 ml.)	Urinary excretion of iron (mg. per 24 hr.)	Dose of I.M. iron (g.)	Serum-iron (µg. per 100 ml.)	Urinary excretion of iron (mg. per 24 hr.)
−2	..	..	0·16	..	..	0·21	..	..	..
−1	..	60	0·18	..	80	0·10	..	..	0·24
0	2 × 0·3	..	0·18	2 × 0·25	..	0·07	2 × 0·25	..	0·23
1	1 × 0·25	1200	0·18	2 × 0·25	1030	0·10	2 × 0·25	..	0·14
2	..	3800	0·20	2 × 0·25	2100	0·15	2 × 0·25	5000	0·18
3	..	3750	0·15	1 × 0·25	3500	0·20	..	10,100	0·15
4	..	2800	0·24	..	..	0·16	..	8200	0·26
5	..	1630	0·17	..	..	0·17	..	..	..
6	..	..	..	..	3200	0·15	..	..	..
7	..	..	..	..	2450	0·15	..	..	..
8	..	400	..	..	..	0·10	..	1150	..
9	..	..	..	..	1030	0·12	..	495	..
10	..	..	..	..	790	0·05	..	..	..
11	..	..	..	..	480	..	..	..	..
Total dosage of iron (mg.)	850	..	..	1750	..	..	1500	..	..

of heparinised plasma derived from the same specimen of blood.

Hæmoglobin was determined with the M.R.C. photometer (100% = 14·8 g. of Hb per 100 ml.), and packed-cell volumes were measured by Wintrobe's (1933) standard method.

One intramuscular injection of 5 ml. (250 mg. of iron) was given to each of 4 people with Hb 55–92%, and the serum-iron levels were determined serially; twenty-four-hour collections of urine were used to estimate the urinary excretion of iron. Table I shows that the highest serum-iron levels were reached in one or two days and normal levels were regained six or seven days after the injection. There was no evidence of any increased urinary excretion of iron by any of the subjects during the investigation.

Larger (therapeutic) intramuscular injections of the iron preparation were given to 3 anæmic patients over two to four days. Table II shows that there was no increase in urinary excretion of iron with serum-iron levels up to 10·1 mg. per 100 ml. Single twenty-four-hour collections of urine from other patients at the time of their peak serum-iron level also showed no increase of urinary excretion of iron with serum-iron levels up to 11·2 mg. per 100 ml.

One intramuscular injection of 5 ml. of iron preparation per 64 kg. of body-weight was given to each of 5 healthy volunteers, and the serum-iron levels were estimated (fig. 1). It will be seen that there is considerable variation in the results, the peak serum-iron level usually occurring twenty-four to forty-eight hours after injection and varying from 830 to 1760 µg. per 100 ml. The serum-iron levels, however, approached their pre-injection values in all the volunteers about six days after the injections.

One intramuscular injection of the preparation was given to each of 5 anæmic patients (Hb 50–76%), and the serum-iron levels were estimated. 3 of these patients were given 250 mg. of iron (5 ml. of the preparation), irrespective of their weights, and 2 were given 5 ml. per 64 kg. of body-weight. The results are shown in fig. 2. Because of some variation in the patient's weights the serum-iron levels are not strictly comparable in all cases; but, even so, it can be said that, as with the healthy volunteers, there was considerable variation in the peak serum-iron level after the injection. For example, 2 patients of much the same weight and with the same initial amount of hæmoglobin (60%), who each received 250 mg. of iron, gave quite different peaks of serum-iron level—1960 and 1000 µg. per 100 ml. The serum-iron level approached normal limits after about six days.

From the serial serum-iron levels in the patients receiving therapeutic doses of the iron preparation there seemed to be little correlation between the initial hæmoglobin level and the serum-iron level reached. One feature common to the patients receiving therapeutic doses (850–1750 mg.) of intramuscular iron was the return of the serum-iron level to within or near normal limits about seven days after the peak serum-iron level had been reached.

To assess whether the variation observed in serum-iron levels after a single intramuscular injection was due to the rate of absorption of the iron preparation from the muscle or to the rate of utilisation of the preparation, further experiments were devised. The subject was given one dose of iron intramuscularly, the serum-iron levels were followed for six days, after two more days the same dose of the iron preparation was given intravenously, and the serum-iron levels were again followed. The injections (5 ml. per 64 kg. of body-weight) were given to 2 anæmic patients and 2 healthy people. The experiment was then abandoned because the patients developed moderate reactions after intravenous injections. Fig. 3 shows the results in these 4 people.

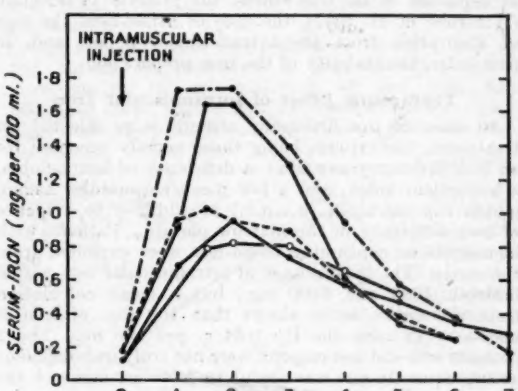

Fig. 1—Serum-iron levels in 5 non-anæmic persons after one intramuscular injection of 250 mg. of iron preparation per 64 kg. of body-weight.

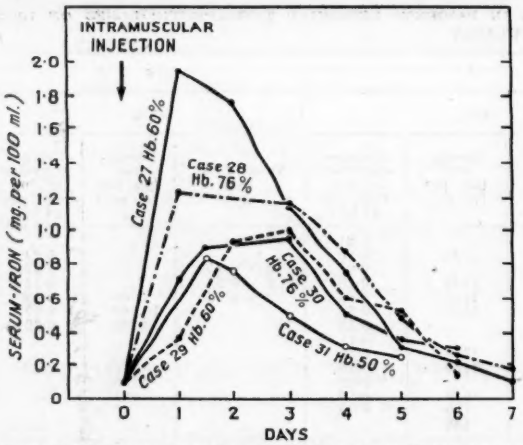

Fig. 2—Serum-iron levels in 5 anæmic patients (cases 27–31) after one intramuscular injection of iron preparation as follows :

Case no.	Wt. (kg.)	Hb %	Dose (mg.)	
27	52	60	250	
28	56	76	250	
29	51	60	250	
30	64	70	250	250 per 64 kg.
31	57	50	225	

The iron preparation did not disappear from the serum so quickly as does saccharated iron oxide. Nissim (1954) found that after one intravenous injection (300 mg. per 60 kg. of body-weight) of saccharated iron oxide the serum-iron level fell from an initial value of 10 mg. per 100 ml. to 1 mg. per 100 ml. in six hours. With the present preparation given intravenously in slightly smaller dosage a comparable fall in serum-iron level took about three days.

In the patient with Hb 50% (fig. 3) after intramuscular injection the serum-iron level returned to normal more quickly than in the healthy people but after intravenous injection it took the same time to do so as in the healthy people. The lower serum-iron levels found in this anæmic patient after intramuscular injection may possibly be due to impaired absorption from the muscle.

There does not appear to be any significant difference in the rate of fall of serum-iron levels between anæmic and non-anæmic people who received intramuscular injections of the present preparation, contrary to what might be expected from the work of Cartwright et al. (1948) with intravenous iron ascorbate. This fall in serum-iron level, however, depends on several factors : the state of depletion of the iron stores, the presence of infection (Wintrobe et al. 1947), the rate of utilisation, the rate of absorption from the intramuscular depot, and, in particular, the stability of the iron preparation.

Therapeutic Effect of Intramuscular Iron

40 cases of iron-deficiency anæmia were selected for treatment, the criteria being those usually accepted for an iron-deficiency anæmia : a deficiency of hæmoglobin, a low colour-index, and a low mean corpuscular hæmoglobin concentration (M.C.H.C.) in addition to evidence of iron deficiency in the marrow picture. Patients with hæmolysis or continuing blood-loss were excluded from the series. The total dosage of intramuscular iron varied between 1000 and 2500 mg., but a mean calculation from the entire series shows that 100 mg. of iron is necessary to raise the Hb 0·34 g. per 100 ml. The 2 patients who did not respond were not truly iron-deficient as subsequently one was found to have uræmia and the other bronchogenic carcinoma.

No reactions were observed in spite of serum-iron levels as high as 13·8 mg. per 100 ml. (13,800 μg. per 100 ml.). Occasional staining of the skin was seen, but this was due to faulty technique and was later completely avoided. However, in view of this danger the buttock is the area of choice for intramuscular injections of iron. The total dose of iron was given in three or four days to patients in hospital, but out-patients received injections twice weekly with satisfactory results. Table III shows typical results in 20 patients as regards hæmoglobin and M.C.H.C.; great clinical improvement in well-being and appetite was also observed. A further 20 patients showed a similar increase of hæmoglobin, an average increase of 0·34 g. per 100 ml. being obtained per 100 mg. of iron injected in the entire series.

Illustrative Cases

Case 32.—A girl, aged 18, attended outpatients on Jan. 7, 1954, with symptoms of a duodenal ulcer, whose presence was confirmed by barium-meal radiography. Hb 52% (7·7 g. per 100 ml.), red cells 3,800,000 per c.mm., M.C.H.C. 24·1 g. per 100 ml. An ulcer régime was started and a course of 'Neo-Ferrum' 2 drachms thrice daily, but the patient could not tolerate the iron, which caused vomiting and diarrhœa. On April 12 the blood-count was unimproved (Hb 54%), and intramuscular iron therapy was started, 6 ml. being given daily in the outpatient department for four days (total dosage 24 ml.). The hæmoglobin four weeks later was 76%, and nine weeks later 80% (see fig. 4). Then 5 ml. of intramuscular iron was administered on two consecutive days, bringing the total dosage to 34 ml. (1700 mg. of iron). Twelve weeks after the start of therapy Hb was 96%, red cells were 4,700,000 per c.mm., and M.C.H.C. was 32 g. per 100 ml. A slow improvement in the patient's symptoms preceded the hæmatological improvement, and no pain or staining was observed at the intramuscular site.

Case 17.—A man, aged 58, who lived alone on an inadequate diet, was admitted on March 4, 1954, with a moderate iron-deficiency anæmia (Hb 54%, red cells 4,100,000 per c.mm., M.C.H.C. 24·4 g. per 100 ml.). Investigations confirmed iron deficiency, but a barium meal, barium enema, fat balance,

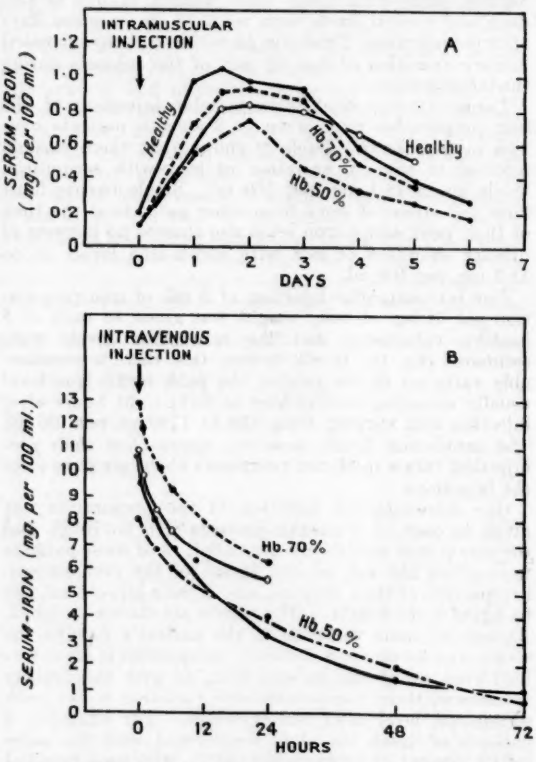

Fig. 3—Serum-iron levels in 2 anæmic patients and 2 healthy persons after injection of iron preparation 250 mg. per 64 kg. of body-weight : A, intramuscularly ; B, intravenously.

TABLE III—THERAPEUTIC RESULTS OF INTRAMUSCULAR IRON THERAPY IN 20 PATIENTS

Case no.	Age (yr.)	Sex	Diagnosis	Before therapy		After therapy		Total dose of iron (mg.)
				Hb %*	M.C.H.C. (g. per 100 ml.)	Hb %*	M.C.H.C. (g. per 100 ml.)	
7	40	F	Primary iron-deficiency anæmia	40	23·8	94 (10)†	34·0	2500
8	44	F	Primary iron-deficiency anæmia	63	26·1	88 (6)	33·6	1250
9	80	F	Nutritional iron-deficiency anæmia	55	25·2	95 (8)	33·4	2500
10	52	M	Postgastrectomy	58	25·8	87 (7)	34·7	1750
11	76	M	Primary iron-deficiency anæmia	62	24·7	95 (12)	33·7	1250
12	38	F	Uræmia	59	26·1	60 (8)	26·2	1250
13	74	F	Anæmia due to ulcerative colitis	60	25·4	80 (7)	30·6	1250
14	58	F	Nutritional iron-deficiency anæmia	32	23·1	80 (10)	33·5	2000
15	49	F	Rheumatoid arthritis	57	26·3	80 (6)	32·8	1500
16	78	M	Nutritional iron-deficiency anæmia	52	24·8	84 (7)	32·3	1500
17	58	M	Iron-deficiency anæmia	54	24·4	101 (7)	33·1	1500
18	60	F	Ulcerative colitis	53	25·1	82 (7)	29·2	1500
19	58	F	Septicæmia and iron-deficiency anæmia	54	25·6	86 (10)	29·1	1500 (some staining)
20	53	M	Hæmatemesis	40	22·9	90 (12)	32·8	2000
21	20	F	Duodenal ulcer	52	25·1	80 (6)	28·0	1500
22	50	M	Postgastrectomy syndrome	58	26·3	82 (8)	30·1	1000
23	55	M	Bronchogenic carcinoma with secondaries	58	27·4	62 (13)	27·1	1500
24	50	F	Rheumatoid arthritis	55	24·8	85 (10)	32·4	1500
25	42	M	Nutritional iron-deficiency anæmia	48	23·4	84 (10)	33·4	1500
26	62	F	Hiatus hernia	54	23·1	90 (10)	31·4	1500

*Hb 100 % = 14·8 g. per 100 ml. †Figures in parentheses represent weeks between estimations of Hb.

fæces for occult blood, and other tests failed to elucidate any cause for the anæmia. He was given oral iron therapy for four weeks, but the Hb did not increase, and he was treated with intramuscular iron 5 ml. twice daily for three days (1500 mg. of iron). Subsequent blood-counts after three and seven weeks showed Hb 78% and 101% respectively (fig. 5). The M.C.H.C. was 33·1 g. per 100 ml. after therapy.

The individual Hb response to intramuscular iron varied considerably from case to case—e.g., in case 17 the Hb had increased to 101% after seven weeks, compared with only 76% in case 32. The average increase

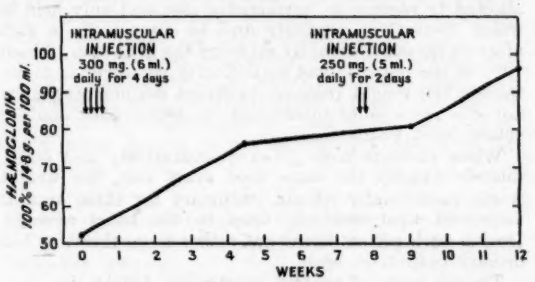

Fig. 4—Hæmoglobin response of case 32 to therapeutic dose of 1700 mg. of intramuscular iron (see text).

of Hb per 100 mg. of iron injected was 0·28–0·48 g. per 100 ml. (mean 0·34 g. per 100 ml.), 1500 mg. of iron being needed to increase the Hb 35% in the average case. A significant response in Hb was usually delayed for a week after the start of treatment.

Discussion

The iron preparation given intramuscularly was well tolerated in all the cases. The only disadvantage lay in the possible staining of the skin, but this could be avoided by the injection technique described above. There were no early or late reactions in the intramuscular therapy, but a high proportion of the patients given the same preparation intravenously in a dosage of 4 or 5 ml. experienced moderate late reactions (headache, backache, shivering attacks) an hour or more after the intravenous injection. High serum-iron levels were attained in these trials, 10–13 mg. per 100 ml. being reached after therapeutic injections. Klopper (1951) postulated that toxic effects following intravenous iron therapy occurred when the iron-binding capacity of the plasma was exceeded, the total iron that can be bound to the β-globulin fraction of the whole of the plasma being about 16 mg. Nissim (1954) pointed out that with iron saccharate this value was vastly exceeded without reaction, and that therefore the β-globulin could not be concerned with the transport of iron saccharate in the plasma. The occurrence of the high serum-iron levels in the present series without toxic effects suggests that the present dextran-iron complex is also not transported by the β-globulin fraction or siderophilin.

The higher concentration of the present preparation (5% of iron) allows a given iron deficit to be remedied by fewer injections than are needed with other iron preparations.

The present patients with iron-deficiency anæmia were successfully treated by the intramuscular injection of iron preparation, and the utilisation of the iron can be expressed as an increase in Hb of 0·34 g. per 100 ml. for each 100 mg. of iron injected—i.e., 43 mg. of iron would raise Hb by 1%. The time taken to achieve the maximum Hb response was 4–9 weeks, which is longer than was found with intravenous iron by Slack and Wilkinson (1949) and Govan and Scott (1949), who found a maximal increase in Hb in 3–5 weeks. Nissim (1949) states that 25 mg. of intravenous iron (saccharated iron oxide) would be expected to increase the Hb by 1%, which is a greater increase in Hb in proportion to the injected iron than is obtained with the present intramuscular preparation.

We feel that this preparation is effective and safe but should be restricted to iron-deficiency anæmia unresponsive to or intolerant of oral iron where adequate investigation has disclosed no other cause—e.g., such as occult blood-loss due to gastro-intestinal neoplasm.

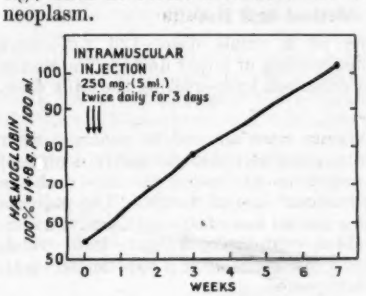

Fig. 5—Hæmoglobin response of case 17 to 1500 mg. of intramuscular iron (see text).

Summary

A preparation of iron for parenteral use is described.

Tolerance experiments in volunteers were satisfactory.

The iron given parenterally was absorbed from the intramuscular site and utilised.

After a single intramuscular injection of 4 or 5 ml., serum-iron levels attained a variable peak in one or two days and returned to about normal after six or seven days in both anæmic patients and healthy people.

There was no evidence of increased urinary excretion of iron after injection of the preparation.

The injected iron disappears from the serum more slowly than does saccharated iron oxide.

In spite of serum-iron levels as high as 13·8 mg. per 100 ml. no toxic reactions were observed after intramuscular injections.

38 out of 40 cases of iron-deficiency anæmia responded adequately to intramuscular treatment with the iron preparation. It was found that 43 mg. of iron intramuscularly would raise the Hb level by 1%, and the period taken to achieve the maximum rise in Hb was 4–9 weeks.

A difference in Hb response was observed between the present preparation and saccharated iron oxide.

We express our thanks to Dr. H. P. Brody, Dr. A. Jordan, Prof. G. M. Wilson, and Dr. E. K. Blackburn for helpful advice and criticism; Dr. F. Fletcher of the clinical investigation department of Messrs. Bengers Ltd.; and Sisters A. M. Smith and S. D. Brent, of the Royal Infirmary, Sheffield, for their invaluable coöperation. Messrs. Bengers Ltd. supplied the intramuscular dextran-iron solution.

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THE ACTION OF CHORIONIC GONADOTROPHIN IN THE OBESE

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IN most cases of obesity the distribution of excess fat somewhat resembles that obtaining in Fröhlich's syndrome. It therefore seemed worth while to experiment with the anterior-pituitary-like chorionic gonadotrophin derived from human pregnancy urine * which has long been advocated for the treatment of Fröhlich's syndrome.

Method and Results

Daily injections of a small dose—125 I.U.—were preferred to a wider spacing of larger doses. The results observed were not enhanced by increasing the daily dose.

Simple Obesity

When obese patients were allowed to continue their usual feeding-habits, gonadotrophin distinctly decreased in ten days the measurements round the hips and the waist without a significant loss of weight. The patients invariably noticed a partial loss of appetite, and particularly that the sudden compulsive hunger, from which many suffered even a few hours after a substantial meal, had completely disappeared.

The change in measurements was interpreted as a dispersal of fat away from the more favoured sites, and it was thought that fat "in transit" might be more readily available for metabolic purposes than fat in "fixed deposit," in which case it should be possible to keep such patients on 500 calories a day without their feeling weak or hungry.

Gonadotrophin was given three or four days without dietary restriction; then the patients were restricted to two meals a day, each consisting of 100 g. of lean meat, a normal helping of leafy vegetables, an unsweetened rusk, and an apple or the equivalent in fruit, with salt and fluids ad lib. The average daily loss of weight was 250–600 g., without any inconvenience being caused, even to patients doing a hard day's work. In well over 500 cases, treated during the past twenty years, this effect was regularly observed in all types of obesity, in both sexes, at all ages, including women who had had both ovaries removed.

After about forty days of this treatment and a loss of 20–30 lb. a normal appetite returned in spite of continued injections, evidently owing to the well-known "immunity" which the body develops to gonadotrophin. This lasted for about six weeks, after which another course could, if required, be given with the same effectiveness as the first. In extreme cases a third and even a fourth course could be given in this manner. In cases in which only a slight reduction was required the same feeling of inadequacy of the diet arose abruptly as soon as the visibly superfluous fat was removed. Similarly, patients who stopped the injections but continued the diet found that they could manage this for about three days, during which time they continued to lose weight, but that they then suddenly felt weak and hungry and were forced to increase their diet and ceased to lose weight. Three days after the last injection patients were allowed to resume an unrestricted diet and only held to weigh themselves regularly and to compensate a gain after an excessive meal by skipping the next one. About 70% of the patients had no difficulty whatever in maintaining the weight reached, provided neither pregnancy nor the menopause intervened, in which case another course could be given.

When patients were given quantitatively and qualitatively exactly the same food every day, the weight would occasionally remain stationary for three or four days and then suddenly drop to the usual average. During such phases there was either more thirst or less urinary output, or both.

Though signs of protein or vitamin deficiencies were never observed, some patients occasionally complained of the typical symptoms of hypoglycæmia. A teaspoonful of sugar controlled these at once and did not, when taken in these circumstances, interfere with the loss of weight.

The treatment did not deplete the cutaneous or other essential fat, the face retaining its freshness and turgor throughout.

When, unknown to the patient, physiological saline solution was substituted for the gonadotrophin, the regular loss continued for about three days, after which the patients complained of feeling weak or dizzy, became irresistibly hungry, lost no further weight, and either ate secretly or declared themselves unable to continue the treatment. As soon as treatment with gonadotrophin was resumed, they again felt fit and perfectly satisfied with their 500 calories.

Diabetes

When overweight diabetics were reduced in this way they did not develop acetonæmia, and in mild cases with blood-sugar levels ranging up to 200 mg. per 100 ml., the blood-sugar level remained normal after the treatment so long as the weight was not regained. When, as occasionally happened, some weight was later regained, with a concomitant rise in the blood-sugar level, a second course

* 'Antultrin S' (Parke Davis) and 'A.P.L.' (Ayerst Laboratories Inc.) were used.

had the same effect as the first. At least twenty injections were necessary to produce this effect. Apart from the fact that it is almost impossible to keep a diabetic on 500 calories a day for several weeks, a more gradual reduction with diet only did not have this effect on the blood-sugar level. Gonadotrophin alone given in any dose to underweight diabetics had no effect whatsoever on the blood-sugar level.

Gout

Analogous conditions obtained in gout. After a gonadotrophin diet treatment the blood-uric acid level was much reduced or even normal, and though most patients experienced an acute attack during the treatment they remained well after the treatment, regardless of what they ate so long as they did not regain weight.

Blood-cholesterol

An abnormally high blood-cholesterol level behaved in the same way, with the further interesting feature that during treatment the free cholesterol increased while the esterified fraction decreased until values otherwise only seen in pregnancy were sometimes reached.

Effect on Gonads

Apart from its action on abnormal fat, which appeared to be independent of the gonads, treatment stimulated the generative system. There was a great increase in libido in its broadest sense, and the frequency with which pregnancy took place during or soon after treatment was such, even in women who had hitherto considered themselves sterile, that it became an ethical obligation to warn women of childbearing age about this before treatment was started. Oligomenorrhœa and hypercestrogenic dysmenorrhœa were promptly relieved. Fluor albus simplex usually ceased within ten days. An abnormal loss of head hair stopped. Brittle finger-nails became normal. Professional singers noticed an improvement in the quality of their voices.

The characteristic "pituitary" headaches and the lethargy of the obese were relieved within a week. As in pregnancy, arthritic and vaguer "rheumatic" pains disappeared to a great extent, long before the loss of weight could furnish a mechanical explanation of the phenomenon.

Peptic Ulcers

It was repeatedly observed that, though peptic ulcers did not necessarily heal, symptoms therefrom were completely relieved.

Skin Disease

During treatment a large variety of dermatoses cleared up in a matter of days, particularly those of allergic origin; even psoriasis showed an unmistakable, though temporary, improvement. Again the analogy to pregnancy was striking.

Conclusion

These results seem to suggest that chorionic gonadotrophin plays a rather more important rôle in the body's endocrine regulations than has hitherto been assumed; that there are vitally important reasons for its overproduction in pregnancy; and that it is in some way specifically concerned with the control of obesity in both sexes and at all ages. Although gonadotrophin alone does not reduce weight, it does make a very drastic caloric curtailment possible, and is then therapeutically active in comparatively small doses in all those clinical conditions which are known to improve during pregnancy.

Summary

The results of administering small daily doses of chorionic gonadotrophin from pregnancy urine, combined with a severely restricted diet, to obese patients are reported.

In such patients gonadotrophin appears to render abnormal fat deposits readily available, enabling the obese to live comfortably on 500 calories a day for several weeks.

Other conditions often associated with obesity rapidly improved.

It is suggested that chorionic gonadotrophin is specifically concerned with the control of obesity.

DETERIORATION OF ADRENALINE SOLUTIONS

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SOLUTIONS of adrenaline are frequently used at operations, in order to produce vasoconstriction, to prolong the action of local anæsthetic agents, or, occasionally, to stimulate contraction of the heart in cases of cardiac arrest. The *British Pharmacopœia* dose for adrenaline is 0·1–0·5 mg. (= 0·1–0·5 ml. of a 1 in 1000 solution), and in several reported cases overdosage has resulted in death (Killpack 1952).

We have recently seen several cases where the response to the drug was much less than would be expected with potent solutions. Two cases, not from the same hospital, are of particular interest in that the lack of effect probably saved the patients' lives.

Case 1.—A 7-week-old baby was operated on for congenital heart-disease. During the operation the heart stopped and 10 ml. of 1 in 1000 adrenaline solution was injected into the left ventricle. The heart re-started at the prick of the needle and the child made an uneventful recovery.

Case 2.—A 35-year-old woman was about to undergo exploration of the hip. A 1 in 200,000 adrenaline solution was to be infiltrated, to reduce bleeding at operation. A reply to the anæsthetist's request for a final check as to the nature of the solution was not given until the surgeon had already injected 10 ml. It was then stated to be 1 in 1000 adrenaline. After some delay an attempt was made to lay open the infiltrated area, but as this was very deep the efficacy of this measure seems doubtful. The patient showed no effect from this injection, and she made an uneventful recovery after the operation, which was completed without further incident.

The factors affecting the deterioration of adrenaline solution are well known (Somers and West 1944, West 1945, Bacq 1949). Adrenaline in solution is an extremely unstable compound which is susceptible to light, heat, air, and variations in pH.

Methods

We have investigated stock solutions of adrenaline and have found, as suspected, that some were pharmacologically inactive. In addition we have subjected fresh solutions of adrenaline to the conditions prevailing in their clinical use and have shown that deterioration can take place in these conditions. The same types of syringes, gallipots, and containers were used in these experiments as in clinical work, and these instruments were sterilised in the same sterilisers under identical techniques.

Standard pharmacological tests were used; the effect on the blood-pressure of a cat under chloralose anæsthesia, or the vasoconstrictor effect produced in the perfused hind-limb of a rat.

Results

Samples of 1 in 1000 adrenaline solution were taken at random from the theatre stock cupboard and tested

experimentally. Of four samples, two were completely inactive, judging by their failure to raise the cat's blood-pressure or to produce vasoconstriction in the rat's hind-limb.

By comparison, using a freshly prepared solution made up from the pure salt according to the directions in the *British Pharmacopœia*, 0·1 μg. produced a distinct rise in blood-pressure and vasoconstriction of the hind-limb.

Freshly prepared solutions of differing dilution were exposed to the air at room-temperature for thirty minutes. After this time a 1 in 1000 solution remained fully potent, as did a 1 in 10,000 solution; but a 1 in 100,000 or more dilute solution was completely inactive. After two hours' *exposure to the air at room-temperature the 1 in 10,000* solution showed 50% loss of activity: but the 1 in 1000 solution remained potent for about twelve hours.

The results were identical whether the solutions were in glass containers or in metal gallipots.

When a *1 in 1000* solution of adrenaline was drawn up in a syringe (glass and metal with ceramic piston sterilised by autoclaving) no loss of activity could be demonstrated in six hours.

From these experiments we have concluded that: (1) stock solutions of adrenaline are not always potent; (2) dilution of the stock solution produces a fall in potency; (3) exposure of the solution to room air in glass or metal containers produces a marked loss in activity; (4) solutions drawn up in syringes with only very brief exposure to air do not appear to suffer loss in potency.

Discussion

It is well known that adrenaline solutions, because of their instability, should be "fresh." This term is seldom defined, but all surgeons and anæsthetists who have used local analgesia for prolonged operations are aware that the best results are obtained only when an ampoule of adrenaline is opened and added to the analgesic solution immediately before use. The conscious patient is a sensitive indicator of the efficacy of analgesic techniques.

In recent years the use of local analgesic methods has waned, and the extreme importance of using fresh adrenaline is no longer so universally known. On the other hand, adrenaline is now commonly used to reduce bleeding at operation and in the treatment of cardiac arrest.

For the former purpose the solutions are usually prepared in advance by the theatre staff, to save the surgeon's time. The interval before use may be a quarter of an hour or longer, during which time, as we have shown, very dilute solutions may have undergone appreciable loss of potency.

In thoracic surgery more concentrated solutions are made ready, both in gallipot and syringe, to be instantly available should cardiac standstill occur. Though these solutions deteriorate more slowly, the interval before use—an hour or more—may be long enough for a considerable loss in potency to have occurred. The importance of combining artificial respiration with oxygen and cardiac massage in the treatment of cardiac arrest is now widely recognised. Of the drugs that may be injected adrenaline is the one most commonly used, and many claims have been made for its efficacy. Nevertheless cardiac puncture without drug injection has proved effective experimentally in dogs and clinically in man (Hewer 1953).

These considerations, together with our experimental findings and the case recorded (we have seen others similar), where large doses of "adrenaline" were given without adverse effect, suggest that the claims for this drug in the treatment of cardiac arrest must be cautiously assessed unless accompanied by evidence that the solution was potent.

A solution that is found to be coloured has deteriorated and should not be used; but colourless solutions are not necessarily fully potent (Bacq 1949). Most manufacturers recommend that adrenaline stored for more than eighteen months should not be used; and it might well be of value for boxes of adrenaline to be date-stamped at the time of manufacture, in order that the old stock be always used first.

Summary

Cases are reported where large overdoses of adrenaline were given without ill effect, presumably owing to deterioration of the solutions.

Of four samples of stock 1 in 1000 adrenaline solution, two proved completely inactive.

Freshly prepared solutions of adrenaline exposed to the air at room-temperature lost their potency in parallel with the extent of dilution. A 1 in 1000 solution remained fully potent for twelve hours; but a 1 in 10,000 solution had lost 50% of its potency after two hours, and a 1 in 100,000 solution had lost all potency after half an hour.

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MOULDING POLYTHENE PLASTIC SPLINTS DIRECT TO PATIENT
A SAFE AND PRACTICAL METHOD

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THE lightweight durable plastic splint has many advantages over its counterpart made of plaster-of-paris. The latter, however, is still in general use because plastic splints have been difficult to make. They have in fact been made in quantity only at large hospitals with a special department for their manufacture.

This paper describes a new technique of producing plastic splints as quickly as, and more cheaply than, plaster-of-paris splints.

Materials

Two plastic materials are used, 'Polythene' for rigidity, and polyurethane for padding.

Polythene is the ideal plastic for making splints and appliances which do not have to be completely rigid. Actually they can be made almost rigid, in any desired part, by superimposing a strengthening strip which coalesces during the heating process. *Polythene* is thermoplastic—i.e., it becomes soft and mouldable on heating and returns to its original condition on cooling. At 120°C it moulds itself to the contours of any object on which it is placed. It is one of the lightest of the plastics (*density 0·93*) and is extremely durable. It cannot be broken by any trauma to which a splint is likely to be subjected, and if distorted by a strong force it regains its shape within a few minutes. It is physiologically inert and does not cause skin reactions, even in susceptible patients. Bodily secretions and excretions have no effect on it, and it can be washed with soap and water as often as necessary. It is unaffected by water or any chemicals in common use in industry, and can therefore be used by patients at their work without danger of deterioration. It is not affected by temperatures below 100°C. It is non-inflammable and simply

burns like candle wax if placed in a flame. Finally, since it is transparent to X rays and to ultraviolet light, a polythene splint does not have to be taken off when the patient undergoes either ultraviolet irradiation or radiography.

Polythene can be bought in sheets of various thicknesses, the most useful being $^1/_8$ inch and $^3/_{16}$ inch, and a flesh colour is obtainable which is popular with patients.

Polyurethane is produced commercially as 'Moltopren,' the most useful form again being in sheets $^1/_8$ inch and $^3/_{16}$ inch thick. It is non-inflammable, elastic, and extremely light: the padding for a forearm splint weighs less than 1 oz. In manufacture it is subjected to calendering, and the form we use is the "eight times calendered" type which possesses a "mouldability" superior to that of 'Sorbo' rubber, fitting closely and evenly around protuberances. It is somewhat friable, and care must be taken in washing it. It is an exceedingly comfortable padding and is quite inert, causing no irritation or skin reactions. Like polythene, moltopren is transparent to X rays. It has one other property which is the key to the technique of direct application of polythene to the patient: it is very heat-resistant and, being interposed between the patient's skin and the heat-softened polythene, allows the latter to be moulded direct to the limb without discomfort to the patient. None of the patients I have treated in this way has experienced more than a comfortable warmth. If the technique described later is adhered to, there is absolutely no risk of burning the patient.

Apparatus

The only apparatus required is an oven which attains and maintains a temperature of 120°C. No other equipment is necessary. The heat rays must strike downwards from the roof of the oven, as from a grill used for toasting bread.

At the Whittington Hospital we have converted a disused infra-red "baker" from the physiotherapy department, removing the electric bulbs and substituting three bar electric elements under the dome, designed to produce a temperature of 120°C with the open ends of the baker closed, and the floor covered, with asbestos.

The switches are also backed with asbestos and fixed to the outside of the oven, being separated from it by an air gap of about 2 inches to prevent burning of the rubber lead from the 15-amp plug. From the switches asbestos-covered wires carry the current to the elements.

A polished sheet of aluminium reflects the heat evenly down over the oven floor. It is essential that the floor, on which the polythene rests, is heated evenly; for otherwise the polythene softens unevenly and will not mould accurately.

The switches are designed to cut out one or two of the bar elements when the temperature is rising above 120°C. If the temperature rises more than 5–10° above 120°C, polyurethane may become discoloured. Further the oven must cool down to 120°C before the plastics are taken out for application to the patient. The ideal oven would be one thermostatically controlled, but to avoid expense we simply keep a laboratory thermometer in the oven and check it by eye from time to time.

Making the Splints

The technique of making the splints is very simple. The oven is switched on, and, while it is getting hot, a piece of suitable size and shape is cut out of the polythene sheet, and another piece (1–2 inches larger all round) from the polyurethane sheet. The polyurethane is placed on the asbestos sheet used as a carrying tray, and the polythene is laid on top of it. The temperature of the oven is checked, and when 120°C is reached, the flap of the oven is raised and the tray pushed inside. The flap is lowered, and the temperature is checked again. If it goes over 120°C, one of the elements is switched off. The temperature is carefully watched and, if it is maintained at 120°C or so, the polythene will soften and adhere firmly to the underlying polyurethane within ten to fifteen minutes. After this time the polythene will be seen to have turned clear and translucent; it is then ready for moulding. The heat-resistant polyurethane is not softened or altered in any way by exposure to 120°C and is only moderately warm a few seconds after having been lifted from the oven.

The asbestos tray carrying the plastics is then lifted out, and a piece of stockinet is stretched over the polythene and pressed gently on to its surface. The stockinet adheres lightly to it, and the polythene, with its adherent polyurethane, can then be lifted by it. Within a few seconds of being lifted off the tray the polyurethane loses most of its heat and feels only comfortably warm to the touch. The operator should check that this is so by resting it for a few moments on his own arm: if it is uncomfortably warm, a few more seconds are allowed to elapse.

Fitting a Splint

The materials are laid on the patient's limb with the polyurethane next to the skin. The polyurethane is so heat-resistant that, although it forms a layer only $^3/_{16}$ inch thick between the skin and the polythene, which is at 120°C, no more than a comfortable warmth is experienced. The limb is held in the desired position by the patient or by an attendant while the softened polythene moulds itself and its adherent polyurethane to the limb. It is usually advisable to put a few turns of bandage evenly and very lightly round the limb to hold the plastic in position while it is cooling. This leaves the operator's hands free to hold the joint in the correct position.

Pressure on the polythene must be avoided because it causes uncomfortable warmth of the patient's skin under the point of pressure and leaves unsightly depressions in the soft polythene. It is best simply to lay the plastic on the limb and to bandage it on evenly and lightly. The softened polythene moulds itself spontaneously to the contours. By applying at the correct temperature and by refraining from manual moulding, I have never had a complaint of discomfort, even with a nervous patient.

However, while gaining experience in the technique, it is a good thing to interpose another layer of polyurethane, $^1/_8$ inch thick, between the patient and the plastics which have been in the oven. This does not affect the closeness of the moulding, because the extra $^1/_8$ inch is compressed by the weight of the polythene to about 0·5 mm. Therefore, in the first dozen or so cases, two pieces of polyurethane should be cut, one $^3/_{16}$ inch thick and the other $^1/_8$ inch thick, and the latter should be laid over the limb before the other plastics are applied. The extra layer is not wasted, because it does not adhere to the warm polyurethane, which is not softened or otherwise affected by having been in the oven.

After eight minutes the bandage is unwrapped and the stockinet gently stripped off. The imprint of the stockinet leaves a matt surface, which is preferred by patients to the waxy smoothness of the natural polythene. If any alterations are needed, the areas can be marked out in ink. The cast is then gently sprung. The polythene will not now warp but should be allowed to cool to room-temperature before being trimmed. The extra insulating layer of polyurethane is removed, and the overlap of the adherent layer of polyurethane is cut off with scissors. Any excess of the plastic, as previously marked out, can be cut out with a sharp leather-knife in a few moments. Polythene is not porous; therefore small ventilation-holes should be punched out

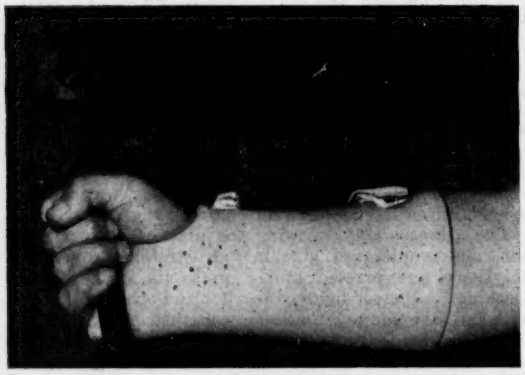

Fig. 1—Plastic splint for wrist of industrial worker who had been off work with painful early rheumatoid arthritis of wrist.

at intervals of 1 inch with a leather-punch or similar instrument.

The whole operation, from the time of putting in the oven to this point, takes some twenty-five minutes—about as long as with plaster-of-paris. But since the plastic splint will last at least as long as half a dozen plaster-of-paris splints, a great deal of time is saved. Moreover, if several patients are fitted with splints at the same session, several lots of plastic can be heated simultaneously. Finally, discarded splints can be re-heated and used to mould a new splint for another patient.

The splint is sufficiently well finished to be worn for a short time, but for the patient who has to wear a splint for an indefinite period a better finish can be made by buffing the edges of the polythene, with either sand-paper or a motor-driven buff, and fixing on straps and buckles. These can be fixed in a few minutes by using bifurcated tubular steel rivets. A hole is punched through the plastics, and a similar hole through the strap. The male and female sections of the rivet are brought together through the holes and fixed together by a firm tap with a hammer. The buckles are fixed to the straps in the same way.

WEIGHTS AND PRICES

The weight of polythene required for a forearm splint is 5 oz., including an extra strengthening strip. The polyurethane required for such a splint weighs less than 1 oz. The buckles, rivets, and straps weigh $1^1/_2$ oz. The finished splint, therefore, weighs about $7^1/_2$ oz. The weight of a comparable plaster-of-paris splint depends on its thickness, but one thick enough to last a considerable time weighs about 14 oz.

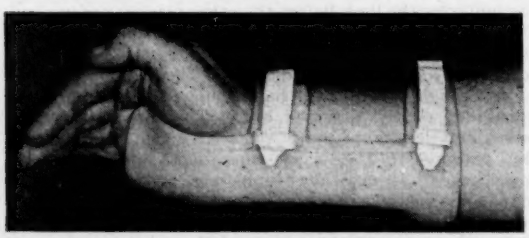

Fig. 2—Plastic splint of very light weight for radial paralysis. Its sole function being to prevent wrist-drop, the splint has been strengthened by $^3/_{16}$ inch strip of polythene in its long axis, and the rest has been cut away except two encircling loops. The cutting away of parts in this "skeleton" type of splint greatly facilitates the moulding of the polythene because the tension of the adherent polyurethane is thus reduced. With this method cervical supports and more advanced spinal jackets are possible.

A box of twelve 4-inch plaster-of-paris bandages costs about 11*s*. 6*d*. and a 3-inch crêpe bandage for fixing the splint to the limb costs about 2*s*. Therefore, if two plaster-of-paris bandages and one crêpe bandage are used, a plaster-of-paris splint will cost about 4*s*. The area of $^1/_8$-inch flesh-coloured polythene sheeting required for a wrist splint costs 2*s*. 9*d*. and an equal area of moltopren costs 7*d*. The straps for such a splint cost 2*d*. These are cut from scrap leather which can be bought in most leather-goods shops at 3*s*. per lb. Two buckles and six rivets cost 3*d*. Thus a finished forearm splint made of these plastics costs 3*s*. 9*d*., which is a considerable saving, added to which the polythene splint will last for years, whereas the plaster-of-paris splint usually has to be renewed about once a month.

DISCUSSION

There is little doubt that polythene is the ideal material for splints, but its use has hitherto been almost exclusively restricted to chronic orthopædic cases—usually in inpatients at orthopædic hospitals. The practical and cheap method of manufacture described here enables the use of polythene splints to be extended to the much more numerous but less dramatic cases which abound in every hospital ward and outpatient department—e.g., subacute and chronic rheumatoid arthritis (fig. 1); osteo-arthritic joints with pain on movement; and neurological cases developing contractures, wrist-drop,

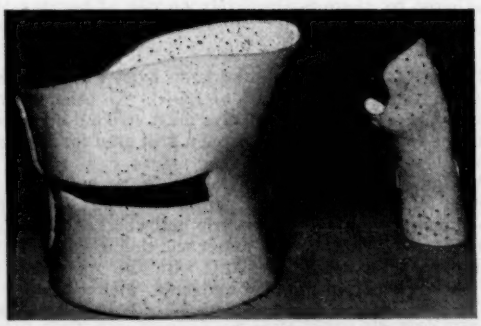

Fig. 3—Low back support and wrist splint for patient with advanced deformity due to rheumatoid arthritis. The back support costs 25*s*. to produce and the wrist splint 3*s*. 9*d*.

(fig. 2) and foot-drop. This type of patient is seldom amenable to prolonged fixation by plaster-of-paris splints, which are almost always discarded by the patient after a few attempts to wear them, and the doctor's work and time are completely wasted. However, it is hard to be critical of the patient, because the discomfort of the heavy plaster-of-paris is well known. Moreover, few patients with such conditions can be convinced that contractures and deformities will eventually result if the splints are not worn. This is the type of patient who will benefit most from polythene splinting, and those who have been splinted by us have been very pleased with the comfort and appearance of their appliances, and I am quite certain that they wear them at times when they are not under a medical eye.

We have so far restricted such splinting to this type of patient, but with experience and practice there is no reason why directly applied polythene splints should not be used for certain types of fracture—e.g., crack fractures without displacement—where complete immobilisation is unnecessary. Again, plastic jackets to support the lumbar spine in cases of prolapsed discs and other causes of chronic low back pain can be made very easily by this method (fig. 3).

The field for plastic splinting is indeed wide, and I hope that this new technique will extend its use to the

treatment of patients at present suffering from joint disorders—and plaster-of-paris splinting.

My thanks are due to Dr. G. H. Dobney, director of the physical medicine department of the Whittington Hospital, for his help and advice and for his permission to publish this paper; and also to Dr. John T. Scales, of the plastics research department of the Royal National Orthopædic Hospital, who first proposed the use of these plastics and whose guidance was of the greatest help. I am also indebted to Mr. J. McGowan and Mr. F. Crees, of the physiotherapy department, Whittington Hospital, and to Miss E. Mason, of the photographic department, St. James's Hospital, Balham, for their help. Polythene is manufactured as "Vitrathene" by Stanley Smith & Co Ltd., Worple Road, Isleworth, Middlesex. Polyurethane is manufactured as "Moltopren" by Kay Bros. Ltd., Reddish, Manchester.

Preliminary Communication

PAROXYSMAL FLUSHING AND OTHER SYMPTOMS CAUSED BY 5-HYDROXYTRYPTAMINE AND HISTAMINE IN PATIENTS WITH MALIGNANT TUMOURS

WE have lately suggested that malignant abdominal carcinoid may give rise to vasomotor skin symptoms, tachycardia, "asthma," hyperperistalsis, and right-sided valvular disease of the heart.[1-3] Isler and Hedinger[4] in Zürich have independently observed the association of malignant carcinoid with pulmonary stenosis in three cases.

We have demonstrated the presence of substances resembling 5-hydroxytryptamine (enteramine, serotonin) in the blood and urine of two patients with carcinoid during attacks of flushing.

To 1 vol. of blood-serum was added 4 vol. of acetone. After centrifugation the supernatant was concentrated in vacuo at room-temperature until all acetone was evaporated. The extract was then tested on the rat's isolated colon, which is very sensitive to 5-hydroxytryptamine but insensitive to histamine.[5] The colon was suspended in 8 ml. Tyrode's solution at 25°C and aerated with oxygen. It was rendered insensitive to acetylcholine by adding atropine 1 : 2·5 million to the bath fluid. The activity of the serum was assayed against serotonin creatinine sulphate (Abbott). The serum in the two cases of carcinoid had a strong contracting effect on the colon; the type of contraction and relaxation after washing was quite similar to that obtained with serotonin. The effect produced by 1 ml. of the serum was equivalent to 12 μg. (case 1) and to 15 μg. (case 2) serotonin creatinine sulphate. This effect was blocked by large amounts of serotonin (2 μg. per ml.), but was not influenced by anti-histamine substances or atropine. The stimulating factor was not destroyed by trypsin or chymotrypsin. According to Erspamer[6] and Faustini the normal blood-serum contains 0·03–0·20 μg. enteramine per ml.

Lembeck[7] has recently found that a benign carcinoid tumour contained large amounts of 5-hydroxytryptamine, and probably also another physiologically active, though unidentified, substance. This work parallels Erspamer's[6] isolation of 5-hydroxytryptamine in the enterochromaffin tissues of Octopus and Discoglossus. In our cases 1 and 2 though the primary tumour had been removed the flushes persisted. Our hypothesis has been that the vasomotor symptoms are caused by a discharge of 5-hydroxytryptamine from the metastatic tumour tissue in liver and lymph-glands. The blood and urine of these patients was found to contain increased amounts of a similar substance, showing that in these patients such substances are present in increased amounts not only in the carcinoid tumours but also elsewhere in the body. It seems reasonable to conclude that the tumour cells produce these substances.

Our knowledge of the physiological importance of 5-hydroxytryptamine is still defective. It is present in blood-platelets, where it probably plays a part in the hæmostatic mechanism by its vasoconstrictive activity. Its rôle in regulating blood-pressure is very uncertain. Its presence in the yellow Kultschitzky cells of the normal intestinal mucosa indicates that it may be important for gastro-intestinal function. It strongly promotes peristaltis, and the flushing in patients with widespread carcinoids is commonly accompanied by borborygmi and diarrhœa. In our opinion the demonstration of its presence in blood and urine is a valuable diagnostic sign in cases of suspected malignant carcinoid, perhaps comparable to the level of acid phosphatase in cases of prostatic cancer, of noradrenaline and adrenaline in cases of phæmochromocytoma, or of gonadotropin in cases of chorionepithelioma.

We believe that we have also observed cases of a related clinical syndrome due to secretion by tumours of yet another substance, as in the following case (case 3) where the patient had very severe flushing of the skin.

Her face, hands, and feet became intensely red; the flush resembled that seen in other cases after the administration of histamine, but it differed from that in patients with carcinoid. During flushes there was slight tachycardia but no urticaria, headache, or itching.[8] The woman was in very good health although for four or five years she had shown radiographic signs of metastases in lungs and bones from an unlocated primary tumour.

We believe that this tumour tissue was producing some substance—possibly histamine—with vasomotor activity. The patient's urine, tested by its effect on the cat's blood-pressure and the guineapig's isolated ileum, contained large amounts of histamine; the depressor action and muscle-stimulating effect obtained were completely blocked by anti-histamine substances. No enteramine action was observed in this case.[9]

In yet another case (case 4) attacks of abdominal pain, retching, and vomiting were accompanied by a slight but definite flush. During attacks the blood and urine contained increased amounts of histamine. Radiography indicated possible stenosis in the lower ileum, but laparotomy revealed no lesion of the intestine. The nature of these attacks is still unknown.

The results of histamine estimations in cases 3 and 4 are shown in the accompanying table.

ESTIMATIONS OF HISTAMINE IN BLOOD AND URINE

Case no.	Date (1954)	Clinical picture	Histamine (μg. per ml.) in	
			Urine	Blood-serum
3	June 24	Flushing	10	9
4	April 5	Flushing	15	
,,	,, ,,	40 min. after flushing	0·5	
,,	June 28	Flushing	2	
,,	,, ,,	40 min. after flushing	0·3	

We conclude that enteramine or allied substances from widespread carcinoids ("carcinoidosis") are physiologically active. In such cases flushing is an important diagnostic sign.

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9. Subsequently a further specimen of urine in case 3 has been found to contain a large amount of histamine. Biopsy has shown a carcinoma of undetermined origin.

Reviews of Books

Aggression, Hostility and Anxiety in Children

LAURETTA BENDER, M.A., M.D., professor of clinical psychiatry, New York College of Medicine. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953. Pp. 184. 40*s*.

Aggression and its Interpretation

LYDIA JACKSON, D.PHIL., B.SC. Oxfd. London: Methuen. 1954. Pp. 237. 21*s*.

BOTH these books have aggression for their central theme. Professor Bender's is a collection of papers written by her and her colleagues in the psychiatric division of the Bellevue Hospital, New York, between 1934 and 1950. It is thus more diffuse and covers a wider field than Dr. Jackson's which is strictly limited to the one theme. Both discuss at length the nature of aggression, and they are at one in rejecting Freud's theory that aggression against others originates in aggression against the self—i.e., in the death wish. Both argue convincingly that aggression is more positive in its origins, and more valuable in its applications, than this. By no means all aggression is antisocial: indeed, it is only to be deplored when carried to excess.

Dr. Jackson uses projection tests scientifically (in the best sense of the term) to compare the reactions of groups of delinquent, neurotic, and normal children. Writing of family relationships, she says: "The neurotic and delinquent children conceive these relationships in terms of mutual hostility with all that it involves. . . . The normal conceive the same relationships in terms of mutual good-will and coöperation, with all that it involves in social adaptation and positive achievement." Professor Bender, on the other hand, seems to derive from her experience a more pessimistic view of human nature. The family relationships of James, aged seven, for instance, leave much to be desired: "I get my feet around her and sock her and yell at the top of my voice. It's more fun than anything. . . . I think Dillinger is the same as me. I am glad I ain't big. I'm afraid I might be Dillinger. I should be in jail." Dr. Jackson's evidence is, happily, more impressive than Professor Bender's.

It is perhaps understandable that Freud first produced the hypothesis of the "death instinct" in the year 1915; the fact that these writers should now begin to doubt it and wish to refute it is perhaps, in itself, a strong piece of evidence against it.

George and John Armstrong of Castleton

Two Eighteenth-century Medical Pioneers. WILLIAM J. MALONEY, M.D., LL.D., F.R.S.E. Edinburgh: E. & S. Livingstone. 1954. Pp. 116. 17*s*. 6*d*.

Dr. Maloney, an Edinburgh-trained neurologist who practised in New York, towards the end of his life became interested in the writings of George Armstrong, of Castleton in Roxburghshire. These had been plagiarised by Michael Underwood, whose own book on children's diseases has long enjoyed the fame which properly belongs to Armstrong. Feeling that this ancient wrong should be righted, Dr. Maloney made a study of the life and work of George Armstrong, who founded the first children's hospital in the world, and of his elder brother John. The latter was a poet, a physician, a friend of Smollett, and the loyal protector and financial backer of George in his efforts to help the children in the poorer quarters of 18th-century London.

George opened his dispensary at 7, Red Lion Square, Holborn, in 1769, and quickly gained a high reputation. Mothers brought their children from all parts of London and "from most of the villages within 8 or 10 miles." While curing the child, Armstrong taught the mother the art of keeping it well. When his funds ran out and his health broke down in 1781 "the number of infant patients relieved by the charity amounted to near 35,000."

Mr. F. N. L. Poynter, who has edited the book, almost anonymously, describes in his preface the difficulties under which the material was collected in Britain and the United States. Before his death Dr. Maloney founded the George Armstrong of Castleton Society to maintain a museum of Armstrongalia at Castleton and make it a place of pilgrimage for pædiatricians. Any profits from the book will go to the society's funds.

Diseases of the Liver

MITCHELL A. SPELLBERG, M.D., F.A.C.P., associate professor of clinical medicine, University of Illinois School of Medicine, Chicago. New York: Grune & Stratton. 1954. Pp. 646. $16.50.

THIS comprehensive and readable textbook is written by an experienced clinician for the practising physician. The arrangement is unusual since hepatic anatomy and physiology are not described as such, but integrated with the accounts of pathology, as in the section on jaundice and portal cirrhosis. The facts are certainly there, but they may be difficult to unravel if the reader is not familiar with liver disease. The summaries at the end of each section will prove helpful for quick revision. The book is well produced, the illustrations are clear, and the bibliography is full though occasionally inaccurate. The price is forbidding by British standards, but we can recommend this work as a very helpful reference book.

Blood Groups in Man (2nd ed. Oxford: Blackwell Scientific Publications. 1954. Pp. 400. 30*s*.).—In the four years since the first edition of this book appeared a ninth blood-group system has been identified and much more has been learnt about the other eight, to say nothing of the private family antigens, the public antigens, and the Japanese antigens. But Dr. R. R. Race, F.R.S., and Miss Ruth Sanger, PH.D., have revised their text and the bibliography in detail. The statistical tables and quantitative information about the frequency of blood-groups are as complete as before. The authors stick to their opinions in favour of the CDE nomenclature for the Rh blood-groups. Faced with the complexities of the Rh chapters, the clinician will be glad to know that the authors "think that physicians, surgeons and obstetricians should not be bothered with more than '*Rh* positive,' '*Rh* negative,' and 'anti-*Rh* present' and, when fathers of children with hæmolytic disease are being reported on, '*Rh* positive, homozygous,' or '*Rh* positive, heterozygous' with the insertion of the word 'probably' when appropriate."

The various blood-group combinations now allow the distinction of 303,264 phenotype combinations, without calling on any rare or unusual variants, and an expert, equipped with sera for testing 7 of the most useful blood-group systems, could exclude 62% of men wrongfully accused of paternity. In discussing the application of blood-groups to genetics Dr. Race and Dr. Sanger point out that especially the Rh and MNSs systems have great potential contributions to make to newer ideas of the nature of genes.

This is still the best book we know on this subject, but it is not for practising doctors; it is for immuno-hæmatologists, forensic pathologists, and geneticists. The publishers are to be congratulated on producing so many complex tables and figures at so reasonable a price.

Care of the Aged (6th ed. London: Henry Kimpton. 1954. Pp. 832. £5 12*s*. 6*d*.).—Dr. Malford W. Thewlis's book is now 35 years of age, older by many years than the specialty of geriatrics, for which it is a textbook. He writes of geriatrics as he has studied it in his clinic in a small American town, where he and his two uncles have between them spanned 75 years of medical practice. His range is wide—from the training of the geriatrician to the systemic diseases he may find in his patients, from hygiene and hobbies to the operation and anæsthetic risks of the elderly. He has had the help of knowledgeable contributors on tuberculosis, fractures, eye diseases, deafness, anæsthetics, and "the mathematical angle"; but the main burden of rewriting the whole text he has carried himself.

New and Nonofficial Remedies (1954) (Issued by the Council on Pharmacy and Chemistry of the American Medical Association. Philadelphia and London: J. B. Lippincott. Pp. 609. 24*s*.).—The council have again revised this helpful reference book which contains accounts of all preparations that have satisfied the council's strict standards. This year they have left out the "bibliography of unaccepted products," which must in the past have made depressing but edifying reading for those about to launch a new pharmaceutical venture. Many of the drugs listed as "unaccepted" have long since gone off the market.

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THE LANCET
LONDON: SATURDAY, NOV. 6, 1954

The Unlocked Door

When PHILIPPE PINEL, more than 150 years ago, released the patients in the Bicêtre from chains and squalor, he also delivered his medical colleagues from the bonds of a fixed idea. His enlightened gesture was the signal for that advance in the study and care of the mentally ill which has gone on ever since, and which is now gaining momentum. Not only doctors but people in general are recognising that mental disorders fall naturally into place beside other diseases, somatic and psychosomatic: and, as this understanding spreads, the dread of mental hospitals is going the way of the old dread of general hospitals. Meanwhile some doctors are asking what need there is for mental hospitals to differ in structure from hospitals of other kinds: surely it is time, they say, to get rid of the high walls and locked doors—symbols of the indefinite sentence which the mentally ill so often serve. Certainly locks and bars are wasted on many mental patients: as the growing numbers of voluntary admissions attest, these are as willing as patients of other kinds to stay in hospital and be treated. Some doctors believe that most if not all patients can be persuaded to coöperate; and that locked doors—anyhow in the daytime—should soon become as obsolete as chains.

On p. 964 we describe some of the ways in which this new policy is being applied, either fully or tentatively; and we give examples of three hospitals, differing considerably in size, in which the plan of having all, or nearly all, the wards completely open seems to be working well. Whether by good management or good luck, no serious incidents have so far resulted from these experiments—the oldest of which dates back as long as twelve years. The benefits, on the other hand, have unquestionably been great. Patients kept under lock and key are bound to look on nurses and doctors (however humane) as gaolers at least as much as therapists; and therapy gains in effect if such an atmosphere is avoided. Again, the patient no longer shows those emotional responses that arise solely from the consciousness of captivity—responses which would be seen in normal people if similarly frustrated but which are nevertheless often put down to his disease. Captivity, moreover, restricts one's choice of company. Even the mentally normal find it barely tolerable to be shut up for a day, or even an hour, with people who grossly annoy or disturb them; yet the mentally ill may be subjected for years on end to this most wearing of stresses, and some undoubtedly deteriorate from this cause alone. Where the wards are open they can seek other company before they are literally maddened further. In addition, freedom is a powerful therapeutic agent.

"What is not generally realised," Dr. DUNCAN MACMILLAN writes to us, "is that there is a definite change in the patients, and that if they are treated in the same way as patients in a general hospital, their whole conduct is affected and improved by an altered reaction to their psychotic disability. What is still regarded in most quarters as psychotic behaviour is really the behaviour of the individual suffering from mental illness who is also subjected to our man-made restrictions, deprivation of individual amenities, legal disabilities and prison conditions."

The effect on the staff is likewise important. No-one can be comfortable in the dual rôle of nurse and warder, and in all three hospitals the nurses—even those who would have opposed the opening of the doors had they known that it was contemplated—testify to a relief of tension since it was done. The doctors, too, have found themselves more at ease with patients. Suspicion on both sides has disappeared, to be replaced by the confidence that patients in general hospitals ordinarily feel in those who are looking after them.

Dr. T. P. REES recounts how, in the early experimental days at Warlingham Park, he found a male nurse closely watching his little flock of gardening patients, in dread lest one should walk off through the newly opened gate. The nurse was told to stop worrying about it: if one, or all, of the patients walked out, the responsibility lay not with him but with the superintendent: he was free to concentrate on being a good nurse. His relief was patent; and the whole atmosphere of the group was changed by his change of outlook.

These experiments suggest, in fact, that we should gain much by opening the doors of all our mental hospitals forthwith. A world of hospital-bred symptoms would dissolve, the relationship between patients and staff would gain immeasurably, and the mental hospitals would lose, almost overnight, the stigma of the old lunatic asylum. Are there drawbacks and risks considerable enough to weight against these gains? Many—perhaps most—psychiatrists believe that there are.

Supporters of the open-door principle claim that the benefit to the vast majority of patients will more than compensate for occasional mishaps; and this may well be true, provided that mishaps remain few and small. Nevertheless the mentally sick sometimes behave in a manner which could alarm not only people they might encounter outside the hospital, but their fellow patients within it. Mental patients feel this strongly: they prefer to be protected, by a locked door, from people in a violent phase. And quite apart from risks to other people, there are risks to the patients themselves. Many depressed patients are admitted because they are contemplating suicide, and others are subject to epileptic mood swings or twilight states in which suicidal impulses overwhelm them. There is always a possibility that one of these may walk out of an open door and throw himself under a lorry. At the open hospitals it is claimed that this does not happen—that when patients have been seen as outpatients before admission, and their confidence has been gained, there is little risk of suicide. It is customary, however, to treat suicidal patients early—usually within a few hours of admission. To critics who deprecate this haste, the answer given is that a preliminary assessment can be made in the outpatient department, and that when the patient is admitted it is to receive some specific form of treatment, which can therefore properly begin at once. But some psychiatrists dislike the thought of being obliged to give electroconvulsive therapy or sedatives before they have had a chance to study their patient, for a few days at least, in hospital.

Some senile patients, too, offer special difficulties. Not all are timid and tractable: some are confused, agitated, and disoriented, and might wander off, lose their way, harm themselves, and be found at last in a state of neglect and starvation. Where all doors are open, will there not be a temptation to keep such patients in bed—a step backwards, the geriatricians would think, in the care of old people? And not merely the old: will there not be a temptation to keep all "uncertain" patients sedated and abed, after locking their clothing away? But, here again, the open hospitals claim that these things do not happen: their aim is to get the patient up and doing; and the second is usually ensured by giving him a very full programme of occupational therapy and social activities.

At present most psychiatrists in mental hospitals seem unwilling to press on with the policy of the fully open door. Many of our largest and most notable hospitals prefer the system at the Crichton Royal (described with the open hospitals on p. 965), where some wards are closed and some are fully open, and stagnation is prevented by careful grading of patients and much flexibility. How much does such a compromise differ from the almost-open system adopted at Warlingham Park and Mapperley? Surely very little in kind, but somewhat more in degree. In all three there are locked places and nurses with keys; and Dr. DUNCAN BELL, of the Dingleton Hospital, Melrose, believes that one locked door is sufficient to vitiate the whole principle of the open hospital. If any patient is locked up, even for a few hours, all have reason to fear restraint; and the sense of freedom and trust, he holds, cannot survive. As he has achieved a fully open hospital and maintained it for two years, his experience carries great weight. It may be that the problems presented by a hospital of just under 500 beds can be more successfully overcome than those of a hospital of 1000 beds or more; but he himself does not think so: he would have the open principle adopted everywhere.

What, then, should be our attitude? If we press for fully open hospitals, with all the unquestionable benefits these represent, what price shall we have to pay in increased sedation of difficult patients, early shock treatment of depressives, and too much time in bed for the old? (For not all hospitals can be trusted to avoid these risks as conscientiously as the three hospitals under discussion.) Or if we decide for the practical compromise of the Crichton Royal, or the greater (but still incomplete) freedom of Mapperley and Warlingham Park, how far will patients and staff be able to think of mental hospitals as strictly comparable with general hospitals? No doubt these questions will require time and experience for their answering, but meanwhile one or two points are worth bearing in mind. Some psychiatrists think we could open all our mental hospitals at once—but only if we had enough staff. We need not only more doctors—for the theory, if not the practice, is exploded that one doctor can look after several hundred patients—but also many more nurses, both men and women. Mental nursing offers more scope for people of good intelligence and mature personality than any other branch of the profession; but, though people of such calibre are to be found in mental nursing, little attempt is made to attract them in numbers; and indeed, but for the innate warmth and good humour, and the sense of service, to be found among Irish women, we should now be hard put to it to get English mental patients nursed at all. We may be long about solving this problem of sufficient nursing care; and some will say that, until it is solved, the ideal of the unlocked door must remain beyond our reach. Those who have tried it, however, agree on one cardinal principle: once the doors are open the patients need not more but less looking after. Perhaps for most hospitals the right line to take is the one adopted by The Retreat, at York, which is gradually opening more and more wards with the purpose of making the hospital completely open as and when experience justifies that course. Meanwhile, Dr. MACMILLAN reminds us, the locked door is merely one of many restrictions placed on the mental patient. In establishing a modern mental health service we should see to it that his whole legal position is reconsidered.

Iron Therapy

IRON-DEFICIENCY anæmia is one of the commonest diseases that practitioners are called on to deal with; and, if it is not secondary to some other disorder, it responds well to proper therapy. Until 1949 iron was almost always given by mouth. The injectio ferri of the *British Pharmacopœia* caused much pain and had an iron content far below the therapeutic level. Ferrous-sulphate preparations were the most used and were very successful; but some patients preferred a liquid medicine to pills or capsules, and for them iron and ammonium citrate was prescribed. But although these preparations sufficed for most patients with primary iron-deficiency anæmia, there remained a group who seemed resistant to iron treatment, and whose blood picture continued to show the characteristic changes. These patients were a pathetic group; the anæmia rarely endangered their lives, and in many ways they became used to dragging on with a hæmoglobin level of 40–60%; but they were always conscious of the disability—the fatigue, the lassitude, the dyspnœa and palpitation on exertion, the unpleasant pallor.

In 1947 NISSIM [1] showed that a saccharated iron oxide could be given intravenously in large enough amounts to treat anæmia effectively, without untoward reactions. In 1949 SLACK and WILKINSON [2] showed how effective was such a preparation in the chronic "resistant" cases of iron-deficiency anæmia. Since then several reliable preparations of iron for intravenous administration have been marketed, and much more has been learnt about these anæmias. In most cases the "resistance" is due to a combination of poor absorption across the intestinal mucous membrane and gradual exhaustion of the body's iron stores. Once these stores are depleted, any absorbed iron remains in store and is not released to the red cells until the store is full; and not enough iron passes across the gastro-intestinal barrier to replenish the stores. By intravenous administration the limitations of alimentary-tract absorption are avoided, and altogether up to 1·5–2·5 g. of iron can be given by this route, divided into doses of

1. Nissim, J. A. *Lancet*, 1947, ii, 49.
2. Slack, H. G. B., Wilkinson, J. F. *Ibid*, 1949, i, 11.

200–500 mg. Occasionally, however, there are difficulties in this method. The patient—usually an obese woman—may have no visible or palpable veins suitable for giving the injection of 10 ml. or more that is needed. Again, the solution of saccharated iron is very dark and therefore not too easy to give; since it is alkaline, if a little gets outside the vein into the tissues an unpleasant local reaction may result. So it is necessary to use well-fitting syringes, preferably all-glass or of glass except for a metal nozzle, and the injection must be given slowly. (Many busy general practitioners find that intravenous injections of iron take up too much time both in preparation and in administration.) In some patients iron cannot be given intravenously, because it causes unpleasant reactions.[3] One of the commonest is pain over the kidneys in the back; another is an allergic type of dyspnœa, and a few deaths due to allergic reactions have been reported. But on the whole intravenous iron has been very successful, and obstetricians in particular have found it useful in treating the iron-deficiency anæmia of pregnancy when time is short and iron by mouth is useless because of gastro-intestinal disturbances.

It was clear that some of the difficulties of intravenous administration would be avoided if instead the iron could be given intramuscularly. The intravenous-iron solution was unsafe for intramuscular injection, because of its alkalinity. But now a dextran-iron solution has been prepared which, so far at least, seems safe and effective; and in this issue Dr. BAIRD and Mr. PODMORE, of Sheffield, describe their experiences with it. This dextran-iron is isotonic with tissue-fluids and has a pH of 6·0–7·0. It is more concentrated than the intravenous-iron solutions, containing 5% of iron, compared with 2%. This is just as well, since few people comfortably tolerate large intramuscular injections, and the dose of intramuscular iron is larger than that of intravenous iron. BAIRD and PODMORE consider that an increase of 0·34 g. hæmoglobin per 100 ml. blood can be expected for every 100 mg. of iron injected (i.e., every 2 ml.); in other words, 43 mg. iron is needed for every 1% hæmoglobin deficit (intravenous doses of iron are usually calculated on the basis of 25 mg. iron for every 1% hæmoglobin deficit, though sometimes up to 37 mg. is given). The intramuscular injection must be given carefully; otherwise the skin will be seriously stained, and the patient will have notable discomfort at the injection site. Even when the injection is given with a $2^1/_2$ in. needle inserted on a Z-shaped track the skin may be stained for several weeks, so the injection should be made into the gluteal muscles. As might be expected, there is considerable individual variation in the effectiveness of the intramuscular injection, as judged by the serum-iron peak; for example, BAIRD and PODMORE gave 250 mg. of iron to two patients of about the same weight with a hæmoglobin of 60%, and the peak serum-iron levels reached were 1960 and 1000 µg. per 100 ml. Corresponding variations were found in the response of the hæmoglobin level, and, as with intravenous iron, it was usually seven days after starting treatment before the hæmoglobin level rose notably. BAIRD and PODMORE gave doses of 5 ml., equivalent to 250 mg. of metallic iron; this dose could be given as often as twice daily to inpatients, but for outpatients twice weekly proved more convenient; in either case the requisite total dose of iron is soon given.

The introduction of a satisfactory preparation of iron for intramuscular injection should make it possible for every iron-deficient patient to be effectively treated. But it would be unwise without clear cause to substitute intramuscular iron for intravenous iron; and oral iron, where this will suffice, should be given in preference to either. Iron preparations for intramuscular injection are still about five times as expensive as those for intravenous injection, and their absorption may be less regular. Intramuscular iron is, at present, essentially a therapeutic weapon to be kept in reserve.

All this work on iron preparations has led to improvements in the way oral iron is presented. Plain ferrous sulphate, in tablets or capsules, is still as efficient as any preparation, and it is very cheap. The difficulty with it is that some patients—usually estimated at about a third—get gastro-intestinal disturbances which are severe enough to prevent the proper dose, or any of the dose, being taken. This difficulty is often avoided when the patient takes enteric-coated ferrous-sulphate tablets, provided the coating is done properly and the tablet disintegrates beyond the pylorus. Intravenous administration of ferric hydroxide has revived its use for oral preparations, and really effective tablets and liquid are now to be had. It is well tolerated and effectively absorbed; ferric hydroxide yields about 50% of metallic iron, compared with 27·5% from ferrous sulphate. Some organic salts of iron are also on trial. Ferrous gluconate yields only 11·5% of metallic iron; it is said to be better absorbed,[4] but the evidence is not very convincing. Ferrous succinate is a similar salt, but there is still no firm evidence of its efficiency and it is considerably more expensive. There are also preparations of iron combined with vitamins, liver, folic acid, and many other substances that the devisers of these "blunderbusses" believe to be useful. In dealing with potent remedies, however, there are not only disadvantages, but positive dangers in the use of complex mixtures; and the more a physician knows of hæmatology the more likely he is to abjure methods which are therapeutically imprecise.

With ferrous sulphate or ferric hydroxide for administration by mouth, and preparations for intravenous and intramuscular injection, every patient with primary iron-deficiency anæmia can now be successfully treated.

Digitalis

IN congestive heart-failure digitalis folia or its purified derivatives should still be the sheet-anchor of treatment; but preoccupation with reducing œdema by restriction of salt intake and administration of diuretic agents has lately tended to obscure the fact that the primary disorder lies in the heart and that the renal disturbances are secondary. WITHERING himself thought that the diuretic effect of digitalis was due to a direct action on the kidney, and recent studies[5] suggest that digoxin may influence the

3. Nissim, J. A. *Brit. med. J.* 1954, i, 352.

4. Haler, D. *Ibid.* 1952, ii, 1241.
5. Farber, S. J., Alexander, J. D., Pellegrino, E. D., Earle, D. P. *Circulation*, 1951, **4**, 378.

tubular reabsorption of sodium; but there is convincing evidence that it mainly acts directly on the cardiovascular system. Early in their studies with cardiac catheterisation McMICHAEL and SHARPEY-SHAFER [6] were impressed by the fall in venous pressure that followed administration of digoxin; this led them to believe that perhaps the main action of the drug was on the venous system, whereby a reduction in venous pressure (comparable to that which follows phlebotomy or the application of tourniquets to the thighs) was followed by a reduction in diastolic filling and lessening of the overload on the heart. Subsequently they and others,[7–10] using improved techniques, found that ouabain or digoxin might cause an increase in cardiac output before, or without, any reduction in venous filling pressure. Thus it was reaffirmed that the primary action of the drug was on the heart itself.

Digitalis has two principal effects on the heart—a direct action on the heart-muscle, and slowing of the heart-rate. MACKENZIE and LEWIS held that digitalis is of value only when failure is associated with rapid fibrillation; but there is now ample evidence that it also brings about great improvement in heart-failure with sinus rhythm. Most of the slowing is secondary to improvement in myocardial function, which is evident from the increased force of systolic contraction, better emptying of the ventricles, and ability of the heart to do as much or more work with less oxygen consumption. It is still insufficiently appreciated that, except in certain arrhythmias, digitalis is valueless unless the heart is failing. In patients with cardiac enlargement but no failure digitalis induces either no change or a fall in cardiac output.[11] Even when failure is present, digitalis may not provide benefit. It is chiefly effective in failure with a low cardiac output; and in this group it is more effective in hypertensive and ischæmic heart-disease (when the metabolism of heart-muscle may be disturbed) than in constrictive pericarditis or aortic stenosis (where mechanical factors may be the outstanding handicap). Exactly how digitalis influences myocardial metabolism is being investigated [12 13]; apparently its action, in common with that of certain other steroids, is concerned with the movement of potassium ions across the cell membrane. By increasing vagal tone, prolonging the refractory period, and decreasing conduction in the atrio-ventricular (A-V) junctional tissue, digitalis is of value in the treatment of paroxysmal auricular tachycardia and auricular flutter, with or without cardiac failure. In paroxysmal auricular tachycardia it is the drug of choice if pressure on the carotid sinus and other simple measures to increase vagal tone do not stop the attack. In auricular flutter digitalis may convert as many as 50% of cases to sinus rhythm and another third to more manageable auricular fibrillation.[14] When it fails to do either and quinidine is given, digitalis administered concurrently diminishes the risk of an accelerated ventricular rate by impairing conduction in the A-V junctional tissue.

Such are the indications for treatment with digitalis. What preparations should be used? There is no evidence that the various digitalis compounds are qualitatively different in their action. Differences between them are due to differences in dosage and in the speed and duration of action. For practical purposes the physician need be familiar with only two preparations: a long-acting one, such as digitalis folia, and a more rapidly acting one, such as digoxin which is quickly absorbed when given by mouth and can be given intravenously in an emergency. The dosage of either cannot be defined except in general terms, because the requirements of each patient are different and often vary considerably during the course of the disease. The dosage should be that which produces the greatest benefit without toxic effects. In patients with auricular fibrillation, the ventricular rate and the disappearance of the pulse deficit are valuable guides to dosage, but in patients with sinus rhythm assessment is more difficult and it is often necessary to persist until mild toxic effects are induced and then reduce the dose. The first toxic manifestation is loss of appetite, which is followed by nausea and vomiting. Bradycardia, premature ventricular contractions, and coupling (pulsus bigeminus) are also common signs of toxicity. Less common signs are vertigo, headache, and electrocardiographic (E.C.G.) abnormalities, such as multifocal premature beats and ventricular or auricular tachycardia.[15] The common E.C.G. changes due to digitalis—namely, depression of the S–T segment and inversion of the first part of the T wave—give no indication of whether the drug is being given in optimal dosage, and conversely severe digitalis poisoning may occur without these changes. The introduction of purified glycosides which can be given by mouth (when they are rapidly absorbed) or intravenously has increased the incidence of toxicity in the U.S.A.[16 17] This is due to two causes: first the practice in that country of attempting full digitalisation with a single large dose, and secondly the now well-established fact that the toxic effects of digitalis appear more readily in patients who are depleted of potassium.[15 18 19] Heart-failure is accompanied by shifts in the body electrolytes; the total body-potassium is reduced, and intensive administration of ammonium chloride and mercurial diuretics enhances the loss of potassium (as well as of sodium) in the urine. Serious digitalis intoxication will be avoided by moderation, shunning the temptation to digitalise the patient unnecessarily rapidly. When rapid digitalisation is necessary digoxin is preferable to digitalis folia or digitoxin, which are less quickly eliminated from the body and so have a longer toxic action if an overdose is given. LOWN and LEVINE [19] have called attention to an auricular tachycardia with A-V block which may be a manifestation of digitalis

6. McMichael, J., Sharpey-Schafer, E. P. *Quar. J. Med.* 1944, **13**, 123.
7. Ahmed, S., Bayliss, R. I. S., Briscoe, W. A., McMichael, J. *Clin. Sci.* 1950, **9**, 1.
8. Bayliss, R. I. S., Etheridge, M. J., Hyman, A. L., Kelly, H. G., McMichael, J., Reid, E. A. S. *Brit. Heart J.* 1950, **12**, 317.
9. Harvey, R. M., Ferrer, M. I., Cathcart, R. T., Richards, D. W., Cournand, A. *Amer. J. Med.* 1949, **7**, 439.
10. McMichael, J. Pharmacology of the Failing Human Heart. Oxford, 1950.
11. Harvey, R. M., Ferrer, M. I., Cathcart, R. T., Alexander, J. K. *Circulation*, 1951, **4**, 366.
12. Szent-Gyorgyi, A. *Bull. N.Y. Acad. Med.* 1952, **28**, 3.
13. Szent-Gyorgyi, A. *In* Mechanisms of Inflammation. Edited by H. Selye. Montreal, 1953.
14. Luckey, H. *Amer. J. Med.* 1954, **17**, 271.
15. Lown, B., Wyatt, N. F., Crocker, A. T., Goodale, W. T., Levine, S. A. *Amer. Heart J.* 1953, **45**, 589.
16. Master, A. M. *J. Amer. med. Ass.* 1948, **137**, 531.
17. Burwell, W. B., Hendrix, J. P. *Amer. J. Med.* 1950, **8**, 640.
18. Lown, B., Weller, J. M., Wyatt, N., Holgne, R., Merrill, J. P. *J. clin. Invest.* 1952, **31**, 648.
19. Lown, B., Levine, S. A. *New Engl. J. Med.* 1954, **250**, 771, 819, 866.

overdosage; and they point out that the rapid heart-rate may prompt the physician to give more digitalis, with fatal results. They have found that 5 g. potassium chloride by mouth will often remove the symptoms of intoxication and stop digitalis-induced arrhythmias.[19 20] Procainamide (0·5–1 g. by mouth four-hourly or six-hourly) may also control the arrhythmias.[21 22] LOWN and LEVINE have sought to solve the problem of whether patients have had too much or too little digitalis by a tolerance test in which a rapidly acting glycoside with a short-lived effect (acetyl strophanthidin) is injected intravenously. The degree of digitalisation is assessed by the amount of the drug required to produce E.C.G. evidence of digitalis intoxication.[19] This test may prove of particular value in determining the digitalis requirements of patients previously given digitalis who develop cardiac failure or an arrhythmia after operation on the heart.

Annotations

THE CODEX

THE *British Pharmaceutical Codex* is almost as old as the century in which we live. The sixth edition,[23] published this week, fulfils even more successfully than its predecessors the intention of the Pharmaceutical Society of Great Britain: "to produce a book of reference for those engaged in prescribing or dispensing medicines."

A good deal of what appears in the *Codex* is necessarily predetermined by the contents of the *British Pharmacopœia*. But for twenty years the *Codex* has published standards for many drugs not contained in the *B.P.* Comprehensiveness is desirable, but the Codex Revision Committee is obliged to bar the way to inclusion when fact is less evident than fantasy. No doubt the committee's sense of responsibility has increased with the realisation that the *B.P.C.* (and the *National Formulary*) now rank with the *B.P.* itself in guiding the Joint Committee on Prescribing in its herculean task of classifying proprietary medicinal preparations. Another outstanding feature of the *B.P.C.*, as compared with the *B.P.*, is the inclusion of paragraphs on actions and uses; thus, in effect, the *Codex* incorporates a handbook of clinical pharmacology. The new edition is notable for a more critical attitude towards the reputed therapeutic value of drugs—old and new alike. The moulding of policy and the fostering of developments in particular directions may not seem to come within the committee's terms of reference. Even so, such is the status and the scope of this book that the work of the experts who revise it inevitably affects the outlook of teachers of pharmacy and of therapeutics; to this extent the *B.P.C.* exercises an important influence on the shape of things to come. The revision committee, however, is obliged to bear in mind that its aim is to meet the needs of contemporary doctors and pharmacists in their professional work. Thus grave doubts about the value of a drug do not necessarily cause mention of it to be excluded. In the words of the introduction:

> ". . . in some instances many medical practitioners have prescribed drugs and preparations with confidence in their effect although convincing clinical evidence of their value is lacking. Such drugs and preparations have not been excluded unless there is acceptable evidence that they are ineffective or that they have fallen into virtual disuse."

This statement is noteworthy for its implication that a drug receives "official" sanction unless it can be proved that it has no therapeutic value—which reflects an attitude that is radically different from one that is voiced in other quarters (and especially by some teachers in our medical schools) that the onus of proof that a drug has therapeutic value rests on those who make the claim. Nevertheless some discrimination is exercised; for if the book were simply a cumulative formulary of all official and non-official remedies, its publication would long ago have proved impracticable.

The additions include nearly a hundred general and special monographs. The potency of the new drugs is another remarkable sign of the times—when the synthetic chemist is virtually the keeper of the doctor's armoury. These drugs include dyflos (D.F.P.), hexamethonium tartrate, phenylbutazone, procainamide sulphate, suxamethonium chloride, and tolazoline hydrochloride. Among antisera, vaccines, and related substances interesting additions are B.C.G. vaccine, diphtheria/whooping-cough prophylactic, and immune human sera. The surgeon's needs are well catered for: among the new dressings listed are delustred regenerated cellulose and animal wool for chiropody. About eighty new items appear in the formulary, but many of these refer to preparations which became official in the *B.P. 1953*. Dead wood has been cut away mercilessly: upwards of two hundred and fifty monographs have been deleted from the old volume, and no fewer than four hundred items have vanished from the formulary. As usual there are many appendices; these have proved invaluable in hospitals and laboratories of many kinds.

It is refreshing to find the main titles of drugs and preparations given in English at the top of each monograph. The Latin title in full and in its abbreviated form is retained but relegated to a lower place. This is an appropriate gesture from the revision committee, whose members have evidently felt the need for plain words and clear thinking; and what language is more expressive than English?

CHEST PAIN

THE diagnosis of ischæmic heart-disease often rests on the history alone; but Morton et al.[1] point out that the six classical features of cardiac pain (onset related to effort or emotion; substernal position, commonly with radiation to the left arm; short duration; constricting in character; rapidly relieved by nitroglycerin) are by no means pathognomonic. Harrison [2] found that the pain was substernal in only half of his patients with angina pectoris. Parkinson [3] pointed out that pain radiating to the left arm may be a symptom of hiatus hernia, pleural disease, or spinal disease. Morton et al. have investigated the chest pain of 100 patients with proven ischæmic heart-disease and 100 with "functional" heart-disease. They found that the two conditions could not be differentiated by the character or site of the pain alone; tightness in the chest and dull aching pain occurred in functional as well as in ischæmic heart-disease. In a quarter of the functional cases the pain was substernal, and associated with effort; and in 36% of those who took nitroglycerin repeatedly, this relieved the pain. On the other hand, among the patients with ischæmic heart-disease, the pain was precordial or in the left chest in 30%; it came on at rest in the same proportion; and it was not relieved by nitroglycerin in 10–15%. Morton et al. point out that none of the six classical features should be relied on alone in differentiating between cardiac and non-cardiac pain, but suggest that if three or more of these features are present, ischæmic heart-disease can be more or less definitely diagnosed.

20. Enselberg, C. D., Simmons, H. G., Mintz, A. A. *Amer. Heart J.* 1950, **39**, 713.
21. Berry, K., Garlett, E. L., Bellet, S., Getter, W. I. *Amer. J. Med.* 1951, **11**, 431.
22. McCord, M. C., Taguchi, J. T. *Circulation*, 1951, **4**, 387.
23. British Pharmaceutical Codex 1954. London: Pharmaceutical Press. Pp. 1340. 63*s*.

1. Morton, A. M., Jaffe, H. L., Pordy, L. *Ann. intern. Med.* 1954, **41**, 315.
2. Harrison, T. R. *Amer. J. med. Sci.* 1944, **207**, 561.
3. Parkinson, J. *Ann. intern. Med.* 1951, **35**, 499.

A careful history and thorough physical examination, combined with electrocardiography, will usually result in correct diagnosis. In doubtful cases the possibility of spinal, gall-bladder, or œsophageal disease, or of hiatus hernia, must be considered. Hiatus hernia should be suspected if the pain is worse when the patient stoops or lies flat, or if flatulence is particularly prominent. Anæmia caused by bleeding from an associated peptic or œsophageal ulcer may also suggest this diagnosis. Gall-stones and hiatus hernia may, of course, be symptomless accompaniments of ischæmic heart-disease; they are not necessarily the cause of the pain. In difficult cases electrocardiography before and after effort is often helpful; in cardiac ischæmia induced by effort the ST segment is depressed and the T wave flattened or inverted. This test should be carried out only when the resting cardiogram is normal or equivocal.

GROUP-A STREPTOCOCCI AND BENZATHINE PENICILLIN

THERE is little doubt that rheumatic fever is initiated and perpetuated by infection of the respiratory tract with group-A streptococci. Prophylaxis, to be effective, must be continuous.[1] For this purpose daily administration of sulphadiazine over long periods has proved effective, simple, and cheap; but because of occasional toxic effects and the increasing emergence of resistant strains, it is not fully satisfactory. Penicillin is superior in both these respects, and it, too, may be given orally [2]; but oral penicillin is expensive and patients dislike having to take tablets daily for many months. The introduction by Szabo et al.[3] of a really long-acting parenteral preparation (benzathine penicillin G) was an important advance; subsequent work [4] has shown that a single intramuscular injection of this sparingly soluble compound gives a detectable blood-level for two to four weeks, depending on the dosage. Perry and Gillespie [5] have now administered this substance to a group of children recovering from rheumatic fever or chorea, who included many persistent carriers of group-A streptococci. Monthly injections of 1·5 mega units of benzathine penicillin quickly eliminated streptococci from the throats of carriers and almost completely prevented new infections. The consequent fall in the incidence of infection in the community led to a rapid reduction in the number of carriers in a "control" group of untreated cases. Diehl et al.[6] have administered benzathine penicillin to outpatients with inactive rheumatic fever, taking as controls the healthy siblings of these patients. Their preliminary results apparently justify this prophylactic use of the drug. Recent trials have shown that prolonged maintenance of a low or intermittent blood-level of penicillin does not give rise to hypersensitivity or cause resistant strains of streptococci to develop, and the only drawback is that most patients complain of tenderness at the site of injection for twenty-four to forty-eight hours. There seems, then, to be good evidence that for the prophylaxis of streptococcal infections in rheumatic subjects benzathine penicillin is an effective alternative to oral sulphadiazine or oral penicillin.

For the treatment of streptococcal respiratory infections, Chamovitz et al.[7] believe that benzathine penicillin G may be the drug of choice. Denny et al.[8] had previously shown that penicillin given in adequate doses and for long enough (a week or, better, ten days) will nearly always prevent an initial attack of rheumatic fever following streptococcal sore throat. But when symptoms subside after a few days, both patient and doctor may be reluctant to continue injections; while oral penicillin, although prescribed, may equally be spurned by the recovering patient. Chamovitz et al. have therefore turned to a single dose of benzathine penicillin in treating streptococcal sore throat. Their results in a carefully planned trial show that among 102 young adults given 600,000 units of benzathine penicillin intramuscularly within three days of onset of sore throat, streptococci were virtually eradicated from the throat within three weeks; the infection evoked a minimal antistreptolysin-O response and no subsequent signs of rheumatic fever. Of an untreated group of 66 similar cases, 80% were still infected at three weeks; the average antistreptolysin response was distinct; and subsequently 2 cases of rheumatic fever and 1 of acute glomerulonephritis occurred. Although penicillin reactions were commoner in this treatment trial than the prophylaxis trials, it is clear that benzathine penicillin is a most promising advance in the treatment of streptococcal respiratory infection.

1. See *Lancet*, 1953, i, 278.
2. See *Ibid*, p. 285.
3. Szabo, J. L., Edwards, C. D., Bruce, W. F. *Antibiot. Chemother.* 1951, **1**, 499.
4. Fletcher, A. P., Knappett, C. R. *Brit. med. J.* 1953, i, 188. Stollerman, G. H., Rusoff, J. H. *J. Amer. med. Ass.* 1952, **150**, 1571.
5. Perry, C. B., Gillespie, W. A. *Brit. med. J.* Sept. 25, 1954, p. 729.
6. Diehl, A. M., Hamilton, T. R., Keeling, I. C., May, J. S. *J. Amer. med. Ass.* 1954, **155**, 1466.
7. Chamovitz, R., Catanzaro, F. J., Stetson, C. A., Rammelkamp, C. H. *New Engl. J. Med.* 1954, **251**, 466.
8. Denny, F. W., Wannamaker, L. W., Brink, W. R., Rammelkamp, C. H., Custer, E. A. *J. Amer. med. Ass.* 1950, **143**, 151.

ARGENTAFFINOMA AS ENDOCRINE TUMOUR

WE have lately drawn attention [1] to the interesting syndrome in which transient macular cyanosis and pulmonary stenosis are found in association with metastasising argentaffinomata. Thorson et al.,[2] who first described this syndrome, suggested that it resulted from secretion by the tumour of 5-hydroxytryptamine (serotonin or enteramine), and this engaging hypothesis is strongly supported by the latest work of Dr. Pernow and Professor Waldenström described in a preliminary communication on an earlier page of this issue. In two cases of the syndrome biological assay showed that the sera contained about a hundred times the normal amount of 5-hydroxytryptamine. Their method of assay, using the rat colon,[3] is highly specific, but more precise chemical identification by paper chromatography [4] should be possible. (Experience with noradrenaline has shown how necessary it is to identify accurately substances which are pharmacologically active.) A third method of investigation is suggested by the fact that 5-hydroxytryptamine, after breakdown by amine-oxidase,[5] is excreted as 5-hydroxy-indole-acetic acid; in health about 10 mg. of this is excreted daily in the urine,[6] but excretion is very probably increased in patients with the syndrome. No standard method of estimating 5-hydroxy-indole-acetic acid has been published; but the process is unlikely to be technically difficult, and would certainly be very valuable in studies of this kind.

Many investigators have been puzzled by the considerable local hypertrophy of smooth muscle which often accompanies argentaffinomata.[7] When the tumour is in the ileum or even the appendix obstruction of the lumen might be the cause; but such hypertrophy has also been found with ovarian teratoma.[8] From the work now reported by Pernow and Waldenström it seems that the hypertrophy is due to the local effect of 5-hydroxytryptamine. Two important points arise from this work. First, it suggests that the secretion of the normal argentaffin cells of the intestine acts by a

1. *Lancet*, Aug. 21, 1954, p. 372.
2. Thorson, A., Björk, G., Björkman, G., Waldenström, J. *Amer. Heart J.* 1954, **47**, 795.
3. Dalgliesh, C. E., Toh, C. C., Work, T. S. *J. Physiol.* 1953, **120**, 298.
4. Jepson, J. B., Stevens, B. J. *Nature, Lond.* 1953, **172**, 772.
5. Blaschko, H., Philpot, F. J. *J. Physiol.* 1953, **122**, 403.
6. Titus, E., Udenfriend, S. *Fed Proc.* 1954, **13**, 411.
7. Dockerty, M. B., Ashburn, F. S. *Arch. Surg., Chicago*, 1943, **47**, 421.
8. Stewart, M. J., Willis, R. A., de Saram, G. S. W. *J. Path. Bact.* 1939, **49**, 207.

strictly local stimulation of muscle; and secondly, it indicates that even the smallest tumours, including those of the appendix, secrete the hormone. (Parathyroid and islet-cell tumours are other examples of very small tumours that produce demonstrable hormonal effects.) Accordingly, it may become possible to diagnose argentaffinomata biochemically, or even clinically, before the relatively gross effects appear.

It is now almost certain that 5-hydroxytryptamine is secreted by the intestinal argentaffin cells, and that it has a local controlling effect on intestinal movements. There is no evidence yet that it is secreted elsewhere or has other functions; but it is now clear that the platelets, whose high content of 5-hydroxytryptamine led to the detection of this substance, take no part in its actual formation. Platelets apparently absorb from serum not only 5-hydroxytryptamine, but also histamine and other unidentified active substances.[9 10] The significance of this is still uncertain; it may represent simply "mopping-up" of active agents which are incidentally in the circulation, or it may provide the platelets with a store of active agents for release at the site of injury.[11]

GRANULOMA OF THE PROSTATE

AN unusual cause of prostatic enlargement has been brought to light by Prof. M. J. Stewart and his colleagues.[12] In two cases where the prostate was hard and fixed, carcinoma was diagnosed, and prostatectomy was done: and in each case microscopic examination showed a granulomatous lesion consisting of areas of fibrinoid necrosis (such as are seen in rheumatic fever) and focal and diffuse infiltration with eosinophil leucocytes (such as is found in many hypersensitivity states). Subsequent inquiry revealed that both patients had asthma.

It is now recognised that allergic disorders may give rise to organic lesions. This is important in treatment; for, while spasm and œdema may respond dramatically to anti-histamine drugs, cellular changes will not do so. In the cases described by Stewart et al. the clinical history stamped the patients as abnormally sensitive, and the presence of eosinophilia pointed strongly to an allergic cause. Moreover, abnormal reactions to streptococci can be demonstrated in rheumatic fever. Nevertheless not all lesions showing fibrinoid necrosis are necessarily allergic. Byrom and others have shown that fibrinoid necrosis of arteries in malignant hypertension can be due to hypertensive changes alone. It is even unwise to regard all "fibrinoid" materials as the same, until we know more of their chemical composition. The surrounding cellular reaction differs in different conditions, and in asthmatics it includes eosinophil leucocytes, which are not particularly conspicuous in the same lesions in non-asthmatic patients.

The association between asthma and rheumatic granulomata, to which Bergstrand [13] drew attention, is of great interest because of its possible connection with the infiltrating pulmonary eosinophilia of Löffler's syndrome. Asthma may well be the cause of lesions confined to the lung: but the disseminated periarterial lesions elsewhere in the body may be coincidental, for asthma is a common condition. Further, if fibrinoid necrosis were to be produced in an asthmatic by any of the causes which are known to produce it in non-asthmatics, a response in which eosinophils were particularly prominent would not be unexpected. Melicow [14] described a case in which the asthma and the disseminated lesions were more closely related, in that both were of recent onset in a patient known to be sensitive to sulphonamides. The patient, previously under treatment for asthma, had to be operated on for prostatic obstruction due partly to benign hypertrophy but mainly to what is described as an "allergic granuloma." At necropsy periarteritis was found to be widespread, involving the heart and œsophagus as well as the pelvic organs. There was also evidence of hypertension and chronic nephritis, so that the significance of the asthma in the production of the lesions was obscure. On the other hand experimental work, notably that of Rich,[15] is more convincing in its evidence that fibrinoid lesions can result from hypersensitivity.

Other examples of granulomatous prostatic obstruction have been recorded. Thompson and Albers [16] collected 36 cases in six years, of which 2 were asthmatic patients resembling Stewart's cases. The urologist may find similar cases referred to him as carcinoma, and he may establish the diagnosis by finding eosinophil leucocytes in the urine or prostatic secretion. But operation will probably be required anyway. The frequency of the condition could be more accurately estimated by physicians in charge of asthmatics; they could determine in such patients how often prostatic obstruction was caused by granuloma and how often by the more usual causes.

In addition to drawing attention to this new syndrome, Stewart et al. have done well to emphasise the need for histological examination in common surgical conditions. There is much yet to be discovered in the often belittled field of morbid anatomy.

SYNTHETIC ERGONOVINE

TRIUMPH follows triumph for the organic chemists. It is not long since quinine and strychnine were synthesised, and now ergot has yielded up an important secret. The active principles of ergot are amides of lysergic acid. Ergonovine, the simplest of these amides, is widely used in obstetrics for its oxytocic effect. The synthesis of lysergic acid has been attempted for many years, and the first total synthesis of this substance has lately been reported.[17] The starting compound was N-benzoyl-3-(β-carboxyethyl)-dihydroindole, and after fourteen stages *dl*-lysergic acid was obtained. Samples of *dl*-isolysergic acid hydrazide were also made, and both the acid and the hydrazide were found to be identical with the corresponding samples derived from natural ergot alkaloids in melting-point, mixture melting-point, ultraviolet spectrum, infra-red spectrum, behaviour on paper chromatography, and X-ray diffraction pattern. Since *dl*-isolysergic acid hydrazide can be resolved and reconverted to ergonovine,[18] this important drug has also been synthesised.

This work may eventually have wide-reaching practical effects. Ergot (rye fungus) is expensive and at times scarce. At present it takes about 1000 lb. of ergot to yield 1–1$^1/_2$ oz. of ergonovine. In America, the price of ergonovine has varied in the last ten years between $60,000 and $100,000 a pound. If the present synthesis can be performed economically on a large scale, ergonovine may become much cheaper.

Sir ANDREW DAVIDSON, F.R.C.P., has been appointed chairman of the Advisory Committee on Medical Research in Scotland, in succession to Sir Edward Appleton.

Prof. AUGUSTE ROLLIER, director of the heliotherapeutic institutions at Leysin, Switzerland, died on Oct. 30 at the age of 80.

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Special Articles

CARE AND DISPOSAL OF MONGOLIAN DEFECTIVES

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IN a survey of mentally defective mongols we collected information about their care and disposal and discovered gaps in the provision made for them.

We attempted to answer the questions: how far is a mongol a problem to his family? How far do the statutory services supply his needs and meet these problems? What more could be done to help the parents of a mongol?

The original sample comprised 479 mongols who had attended The Hospital for Sick Children between 1945 and 1950 inclusive. Of these we excluded 242 for the following reasons:

The home was far from London, 78.
The parents were not traced from the address known to us, 68.
The parents did not wish to be visited (11 of the mongols in this group were dead), 23.
Parents visited, but the mongol was dead, 64.
Mongol known to be illegitimate, 4.
Original diagnosis of mongolism now in doubt, 4.
Mother an unreliable witness, 1.

For the remaining 237 patients the social data were collected by visiting the home and interviewing the parents, sometimes both parents but usually only the mother. The first 13 visits served to gain experience of the problems involved, and full information was collected for 224.

Problems Presented by Mongols

Every mentally defective child is a cause of grief and presents problems to his parents. The disturbance caused in the families visited varied from one which was almost negligible, to one which was sufficiently severe to be seriously interfering with the mental health of the other members of the family or leading to the break-up of the marriage.

The most important factor in this variation was the general competence of the parents. Some families took the mongol's disabilities in their stride: his limitations were fully understood, he got on well with his parents and the other children, the other children were not ashamed of him, and full allowances were made for his retardation. The other major factor was his mental level. The following are two examples of children who created no problems.

A high-grade male mongol, aged 8 years, was at a school for educationally subnormal (E.S.N.). Five elder brothers and sisters were all kind to him and helpful to the mother, who was nearly 50.

A manageable male mongol, aged 5 years, at home, had capable affectionate parents with full understanding of his handicaps and got on well with an elder brother.

The major problems presented can be conveniently classified into practical, including the difficulty of giving the mongol care and attention, and psychological, including disturbances set up in the parents and in other children in the family. Naturally a mongol will often cause problems of both kinds, but where the problems might reasonably be solved by providing institutional or other accommodation it is classed as practical. The problems listed below were those found at the time of visit; in some families there had been earlier problems which were resolved before the visit.

Practical Problems

The mongols, particularly the low-grade imbeciles, caused a great deal of work and required much supervision from the mother. They were often dirty, destructive, noisy, and obstinate, and sometimes also aggressive. Where the mother was elderly, infirm, incompetent, had other young children, or got no help from other members of the household she could not give the mongol all the attention he required, or she cared for the mongol at the expense of her husband or other children.

The number of mongols presenting major practical problems was 12.

Psychological Problems

The ways in which a mongol caused psychological disturbances in the rest of the family were varied. Several parents had failed to accept the mongol's disability and were fighting to avoid his notification as ineducable and at the same time disturbing the mongol by expecting too much of him; mostly these parents had no other children. Some mothers had strong feelings of guilt and believed that some action of theirs, such as an attempt at abortion or the use of chemical contraceptives, had caused the mongolism. Some parents felt guilty because they had sent the mongol to an institution or because, although he was still with them, they could not overcome a strong feeling of repugnance towards him. Some mothers were much afraid of further pregnancies, lest they should have a second mongol.

The number of mongols creating major psychological problems was 14.

Statutory Services

We have classified the mongols into five groups according to the help given by the local authorities and regional hospital boards. The distribution of the patients by age and the provision made for them is shown in table I, and by age, provision, and local authority in table II. There was considerable and probably significant variation between the provision made for the patients in the different areas concerned.

SCHOOLS

Primary schools.—8 mongols, all high-grade and aged 5–12½ years, were managing reasonably well, though often a year or two retarded, in primary schools. In all these cases the provision seemed satisfactory; but one father, himself a schoolmaster, would have preferred an E.S.N. school for his boy, aged 5 years. In addition there were 1 boy, aged 4 years, at a nursery school and 1 girl, aged 8 years, at a private school for normal children.

TABLE I—PROVISION MADE FOR 224 MONGOLS BY AGE

Age (yr.)	Primary or nursery school	E.S.N. school	Occupation centre	Home teacher	Institution	Awaiting admission to: E.S.N. school	Awaiting admission to: Occupation centre	Awaiting admission to: Institution	Occupation centre refused	Not yet assessed or not yet known
3	..	..	1	..	2	..	3	..	..	19
4	1	..	..	..	2	..	2	2	..	19
5	3	..	5	..	5	1	11	1	1	5‡
6	1	4	14	..	6	1	3	2	5	2
7	2	..	21	..	6	..	..	1	2	1
8	2*	5	18	1	6	1	3	..	1	..
9	..	3	10	1	2	..	..	..	..	..
10	..	..	7	..	1	..	..	..	1	..
11*	1	1	5	1†	..	..	..	..	..	..
Total	10	13	81	3	30	3	22	6	10	46

* Includes 1 at private kindergarten.
† Also awaiting admission to an institution.
‡ Includes 1 at a day-nursery.

* In receipt of a grant from the National Birthday Trust Fund.

E.S.N. schools.—13 mongols, aged 6–13 years, attended E.S.N. schools. This provision seemed satisfactory in 11 cases, and there were no major problems in this group. A boy, aged 7½ years, was being given a trial at an E.S.N. school at the parents' insistence. He was showing signs of maladjustment and was attending a child-guidance clinic. His mother was elderly and had married late. In another case the parents thought, with no obvious justification, that the mongol should be transferred to a primary school.

TABLE II—PROVISION MADE FOR 224 MONGOLS BY AGE AND LOCAL AUTHORITY

	Local authority						Total	
	1	2	3	4	5	Others		
Aged 3 yr.:								
At home:								
Not under supervision	3	1	1	1	..	..	6	
Not finally assessed ..	2	4	3	3	..	1	13	
Awaiting occupation centre	..	2	..	..	1	..	3	
At occupation centre ..	..	..	..	..	1	..	1	
At institution	..	1	1	..	..	..	2	25
Aged 4 yr.:								
At home:								
Not under supervision ..	1	6	1	..	1	1	10	
Not finally assessed ..	1	1	2	1	2	2	9	
Awaiting occupation centre ..	1	1	..	..	..	..	2	
Awaiting institution ..	2	..	..	..	..	..	2	
At nursery school	..	1	..	..	..	..	1	
At institution	..	..	2	..	..	..	2	26
Aged 5 yr.:								
At home:								
Not under supervision ..	..	1	..	1	..	..	2	
Not finally assessed ..	..	1	..	..	..	2	3	
Awaiting E.S.N. school ..	..	1	..	..	..	..	1	
Awaiting occupation centre	1	4	1	1	2	2	11	
Awaiting institution ..	1	..	..	..	..	..	1	
Refusing occupation centre ..	1	..	..	..	..	..	1	
At occupation centre ..	1	..	1	1	1	1	5	
At primary school ..	..	1	..	1	..	1	3	
At institution	4	..	1	..	..	..	5	32
Aged 6 yr.:								
At home:								
Not under supervision ..	..	1	..	..	..	..	1	
Not finally assessed ..	..	..	1	..	..	..	1	
Awaiting occupation centre	..	..	1	..	1	1	3	
Awaiting E.S.N. school ..	..	1	..	..	..	..	1	
Awaiting institution ..	..	..	..	1	1	..	2	
Refusing occupation centre ..	2	1	..	..	1	1	5	
At occupation centre ..	5	3	..	1	3	2	14	
At E.S.N. school	2	..	..	1	1	..	4	
At primary school ..	..	..	..	1	..	..	1	
At institution	5	..	1	..	..	..	6	38
Aged 7 yr.:								
At home:								
Not under supervision ..	..	1	..	..	..	..	1	
Refusing occupation centre	..	1	..	..	..	1	2	
Awaiting institution ..	..	..	..	1	..	..	1	
At occupation centre ..	4	6	2	3	3	3	21	
At primary school ..	..	1	..	..	..	1	2	
At institution	3	..	1	1	..	1	6	33
Aged 8 yr.:								
At home:								
Awaiting E.S.N. school ..	..	1	..	..	..	..	1	
Awaiting occupation centre	..	2	..	..	1	..	3	
Refusing occupation centre	..	1	..	..	..	..	1	
Home teacher	..	..	..	1	..	..	1	
At occupation centre ..	3	3	3	3	2	4	18	
At E.S.N. school	2	2	..	..	..	1	5	
At primary school ..	..	1	..	..	..	..	1	
At private school	..	..	..	..	..	1	1	
At institution	3	1	1	1	..	..	6	37
Aged 9 yr.:								
At home, home teacher ..	..	..	..	1	..	..	1	
At occupation centre ..	3	1	2	..	2	2	10	
At E.S.N. school	1	1	..	1	..	..	3	
At institution	..	..	1	..	..	1	2	16
Aged 10 yr.:								
At home, refusing occupation centre	..	..	..	..	..	1 (private tutor)	1	
At occupation centre ..	1	1	2	..	1	2	7	
At institution	..	..	..	..	..	1	1	9
Aged 11 yr. or more:								
At home, home teacher ..	..	..	..	1	..	..	1	
At occupation centre ..	1	1	..	1	..	2	5	
At E.S.N. school	..	1	..	..	..	..	1	
At primary school ..	..	1	..	..	..	..	1	8
Total	53	57	28	27	24	35		224

OTHER PROVISION

Occupation Centres

81 mongols, aged 3–13 years, were attending occupation centres. In 58 cases this provision seemed entirely satisfactory both to the mongol and to his parents; many parents warmly praised these centres and their staffs. In another 7 cases there was no complaint. In several cases, however, it was not an adequate solution to the problem presented by the mongol, and these are detailed below.

2 children in the group presented *major practical problems*:

A boy, aged 6 years, was difficult to manage at home and seriously disturbed his two sisters, one older and the other younger than himself. He has since been admitted to an institution.

A girl, aged 8 years, was difficult and poorly cared for at home, partly because of the mother's incompetence.

Several children presented *minor practical problems.*

One mother wanted her mongol admitted to an institution because she was separated from her husband and wished to go out to work rather than to live on National Assistance. She had another younger child.

Another mother wanted her mongol admitted to an institution because she thought she could then save the marriage and there was another child to consider, but it did not seem that the patient was then the main cause of the parents' incompatibility.

One mongol had an old and tired mother and an older sister who was disturbed by the attention given to the mongol.

4 patients in this group presented *major psychological problems* to their parents.

One mother was gravely emotionally disturbed, separated from her husband, and living in very poor accommodation. She was moderately content to continue caring for her mongol son, aged 9 years, but threatened to take the life of her child and herself.

The parents of a mongol, aged 6 years, did not realise his disability and were fighting a legal battle against his notification as ineducable.

The parents of 2 mongols, boys aged 9 and 6 years, were seriously disturbed by their dislike of the occupation centre and were pressing, without apparent justification, for admission to an E.S.N. school.

The parents of 9 other mongols were unhappy because their child was mixing with older and lower-grade defectives.

In sum four parents of mongols at occupation centres would have preferred an institution, and eleven parents would have preferred some form of schooling for their child.

Home Teachers

3 mongols had home teachers for an hour a week; they lived in rural areas without any occupation centre. 1 of these mongols was a girl, aged 17½, awaiting admission to an institution (see below). 2 others were boys aged 8½ and 9 years.

Institutions

There was considerable and significant variation in the proportion of mongols in institutions in the different regions. In some areas it was relatively easy to get a mongol into an institution; in others it was exceedingly difficult.

Altogether 30 mongols were in institutions. They were aged 3–10 years. However, 23 (or three-quarters) of them came from two areas which between them had only 81 mongols, and the other 7 (or a quarter) from areas which between them had 143 mongols. The age-distribution of the mongols in the areas was similar.

In all but one of these cases the parents were satisfied that the mongol was in an institution and with the care provided. The exceptions were the parents of a girl, aged 5½ years, who was said to have been in an adult ward for six months; these parents would have preferred a Roman Catholic home. There were no practical problems in this group.

There were two *major psychological problems* in this group:

A mongol had been sent to an institution at the age of 8 weeks on the family doctor's recommendation. The parents had not seen the child since, and the mother had strong feelings of guilt.

In 1 case the mother, although she visited the child regularly, was emotionally disturbed, visited a succession of hospitals for gynæcological complaints, and was fearful of further pregnancies, lest she have another mongol.

Several other parents had guilt feelings of lesser degree, had not told later children that they had a brother or a sister in an institution, and explained away their visits to the institution.

WAITING-LISTS

E.S.N. School

There were 3 children, aged 5, 6, and 8 years, all from one local authority (not rural), in this group, of whom 2 presented major problems—1 practical and 1 psychological:

The mother of a mongol, aged 5 years, believed that no vacancy would be available until the child was aged 8 years. The mother was old for her 46 years, and her husband, aged 64, was a chronic invalid with heart-disease. A brother, aged 9 years, was disturbed since the birth of the mongol and was in a residential school for maladjusted children.

The mother of a female mongol, aged 8 years, was very bitter that no provision had yet been made for her child. She disliked the patient, was resentful that she had to have her at home, and was seriously emotionally disturbed.

Occupation Centre

There were 22 children, aged 3–8 years, in this group. Again there was considerable variation according to the local authorities. The two areas (with 81 mongols) which apparently made good institutional provision (see above) also had only 4 mongols awaiting places in an occupation centre, and these were all aged 6 years or less. Of the 3 mongols in this group who were aged 8 years, 1 came from a rural area where the difficulty was only one of transport, and the 2 others, both boys, constituted minor practical problems in that their mothers were elderly and needed help with the care of them. There were no major practical problems.

4 of these patients caused *minor psychological problems* in their families.

In 2 cases, in which the mongols were aged 6 years, the parents were at odds with the local authorities about the assessment of the children.

In the case of a mongol aged 5 years the parents were unhappy because no provision had yet been made.

In another case a young mother with very poor housing, who had an older illegitimate child, regarded her mongol as a punishment for her earlier adultery.

Institution

7 patients were awaiting admission to an institution. 6 of these were young idiots or imbeciles, aged 4–7 years, and the other was an imbecile girl aged 17 (see above).

4 of these patients presented *major practical problems*:

A girl, aged 5 years, was unmanageable. The family lived in someone else's house. There was constant friction over the noise and disturbance caused by the mongol. This child has since been admitted to an institution.

A girl, aged 7½ years, could not walk or talk, bit, scratched, and was very noisy at night. Two older children, aged 13 and 14, were disturbed by the mongol. The mother was exhausted, the father unsympathetic, and the marriage near breakdown.

A boy, aged 6 years, was unmanageable and destructive. The father had deserted. An elder brother had missed much schooling by caring for the mongol while the mother went out to work. This brother became a delinquent and had been removed from the home to a training-school by court order. The mongol has since been admitted to an institution.

A boy, aged 6 years, was helpless and could not sit unsupported but nevertheless managed to be destructive.

3 other mongols presented *minor practical problems*:

1 was the imbecile girl, aged 17, mentioned above. The mother had had no help with this child, except that recently a home teacher had been coming for an hour a week.

A boy, aged 4 years, was already difficult; his mother had 3 other children, aged 5 years, 2 years, and 4 months.

Another boy, aged 5 years, was dirty, destructive, and aggressive.

REFUSING ADMISSION TO OCCUPATION CENTRE

The parents of 10 mongols, aged 5–10 years, refused to let them go to occupation centres:

In 4 cases the parents thought their child would mix with children of lower grade and learn bad habits.

In 3 cases the mother felt that she did not need help.

In 1 case the parents were arranging private tuition.

In 2 cases the parents were still fighting the patient's notification as ineducable.

1 mongol girl, aged 7½ years, fitted into none of these groups but better into this group than any other. This girl was an idiot and helpless, with congenital heart-disease. Her mother cared for her competently and was happy to do so, and helped the local authority by caring temporarily for other mongols.

In 2 cases there was a *major psychological problem*. In both cases the parents wanted E.S.N. education for the mongols, and the whole family were disturbed because they could not accept the fact that the mongol was ineducable. One of these families was planning to move to a different part of the country, where they hoped for better opportunities. The parents of 2 other mongols in this group were resentful of the assessment made by the local authority but not still struggling to get it altered.

UNKNOWN TO LOCAL AUTHORITY OR AWAITING FINAL ASSESSMENT

46 children, aged 3–7 years, were in this group (2 aged 6 years, and 1 aged 7 years). When the parents said that the child was not under supervision, this statement was not usually checked with the local authorities but nevertheless was probably reliable. In the case of a boy aged 7 years, a low-grade imbecile, a check revealed that he was not yet known to the local authority concerned. Many of these children were young and as yet presented no real problems. 1, a boy aged 5 years, was at a day-nursery while awaiting final assessment.

Practical Problems

In this group 5 mongols presented major practical problems:

The mother of a boy, aged 5 years, was awaiting sanatorium treatment for pulmonary tuberculosis; so far as the mother knew, no plans had yet been made for the mongol, and this was worrying her.

In the case of a mongol boy, aged 3½ years, the housing was inadequate, and a younger child seemed emotionally disturbed.

A girl, aged 3 years, was low-grade and difficult, her mother was elderly, the housing accommodation was poor, and there were four older children.

A boy, aged 5 years, was helpless, and his mother was overworked and very anxious that the other children in the family should not be involved.

A girl, aged 5 years, was helpless; her mother had chronic heart-disease and was exhausted.

Psychological Problems

In this group 5 mongols caused major psychological disturbance in their families.

The parents of 1 mongol, aged 4½ years, with one older sibling, had got into considerable difficulties. They had moved because of the patient and taken a house beyond their means; the husband had taken on additional night work to pay for this and could not sleep during the few hours he was at home, because of the noise made by the mongol. The other child was sent to a private school because the headmistress

of the local school knew of the mongol. The mother was emotionally upset.

The mothers of 2 mongol girls, aged 4½ and 5 years, were so repelled by them that they each went out to work and paid a neighbour to care for the child. These mothers were upset by their inability to care for their children.

The mother of 1 mongol boy, aged 5½, wanted more children; but she had attempted abortion early in the pregnancy of the mongol and felt she must go on looking after this child as punishment, seeking no help from the local authority.

The mother of 1 mongol, aged 3 years, had no understanding of the child's condition. She blamed her husband for the mongol. At the time of visit the break-up of the marriage was imminent.

SUMMARY OF DISTRIBUTION OF PATIENTS

21 children were in either primary or E.S.N. schools. 1 was in a nursery school and 1 in a private school for normal children. None of these presented major problems.

81 were in occupation centres. This provision was in general most satisfactory, but 2 mongols still created major practical, and 4 major psychological, problems.

3 had home teachers for an hour a week. All of these lived in rural areas. None of these was a major problem.

30 were in institutions. None created a practical problem, but 2 caused major psychological problems.

3 were awaiting places in E.S.N. schools, and 2 of these presented major problems, of which one was practical and the other psychological.

22 were awaiting places in occupation centres. None created a major problem.

7 mongols were awaiting admission to institutions, and 4 of these presented major practical problems.

10 had places in occupation centres offered to them, but their parents refused them. In 2 cases this had led to a major psychological problem.

46 mongols were either unknown to, or not yet finally assessed by, the local authority. Of these, 5 presented major practical and 5 major psychological problems.

Further Provision Needed

Institutional Accommodation

More places in institutions are needed for low-grade mentally defective, restless, destructive, and noisy mongols. In this survey in all the 7 cases where the child was on the waiting-list for an institution his removal from the home was urgently needed (2 have since been admitted to institutions).

Among the mongols unknown to, or not yet assessed by, the local authority were 3 who should perhaps have been in an institution; 2 of these were aged 5 years and 1 aged 3½ years.

Of the mongols in occupation centres 2, aged 6 and 8 years, still presented grave problems to their parents (1 has since been admitted to an institution).

More places providing permanent or temporary residential care for higher-grade mongols are needed where the mother is ill or incompetent, or other children in the family are disturbed. Local authorities do not perhaps make sufficient use of their permissive power to pay for such temporary places for mentally defective children to give the mother a rest. Some local authorities already make provision of this sort for low-grade mongols on the waiting-list for an institution.

Occupation Centres

More places at occupation centres are needed in some areas, and these should include places for mongols aged 5 years. Occupation centres should perhaps be brought under the educational department. The strong preference of many parents for the E.S.N. school, even where this form of schooling is inappropriate, is due to the fact that a child at these schools is not notified as ineducable under para. 57, sec. 3 of the Education Act, 1944.

E.S.N. Schools

More E.S.N. places are needed in some areas. Ideally these should be prepared to take mongols at the age of 5 years.

Mental-health Workers

More mental-health workers are needed in some areas, and some mental-health workers need better training in dealing with the psychological difficulties of the parents of mongols. Many of the problems of the parents could have been relieved in part at least by more explanation of the facilities available for caring for mentally defective children, and of the reasons why a particular child is sent to an E.S.N. school or to an occupation centre. Many parents could have been reassured, to allay their feelings of guilt. More regular and frequent home visits by the mental-health workers would enable them to pick out the cases where something more than the ordinary facilities are needed to help the family.

Assessment

It would undoubtedly help the parents of mongols if the doctors who make the assessment for the local authority were also able to spend more time explaining to the parents the basis of their assessment. Where the parents ask for a second examination this request should be sympathetically considered and granted if possible; this would often ultimately save the department time and effort.

Hospitals

Often the general practitioner who suspects that a child is a mongol refers the child to a hospital for a confirmation of the diagnosis. It is difficult to spend time on these children at a busy outpatient clinic; but, if at all possible, it would certainly help the parents if some explanation of the nature of mongolism and of the child's probable development was given. Many parents in this survey came away from their visits to hospitals with the impression that they had been told the child was an idiot who would never walk and talk; they were later resentful because the child had done better than this and proved to be (as do most mongols) an imbecile.

Parents are appreciative if the mongol is given a routine physical examination. It is most helpful if the parents are allowed to bring the child back for a second visit in a few months' time. At the first visit they do not take in all the implications of, or even misinterpret, what they are told and will have questions, important to them, to ask at a second visit. Parents in this series who had been bringing their children up for occasional visits to the clinic for congenital heart-disease were noticeably better adjusted to their child's handicap than were most of the parents. The practice of referring parents to the almoner's department for detailed explanation of the facilities provided by local authorities has been helpful.

Any doctor diagnosing mongolism must obviously be wary of recommending to the parents that they should put their child into an institution until he has found out if there are any vacancies in that area. Otherwise after mental conflict the mother may accept this advice only to be told that there will be no vacancy in the regional hospital board's institutions for several years, and private homes are expensive.

General Practitioner

In several cases the general practitioner had been the major agent in solving the parents' problems with the help of the statutory services.

Voluntary Organisations

Many parents have been greatly helped to an understanding of their child's handicap and to lose their sense of isolation in misfortune by membership of the Association of Parents of Backward Children.

We are indebted to the National Birthday Trust Fund for a grant which made this survey possible. We are grateful to Prof. Alan Moncrieff and Miss M. J. Mayfield for their interest and advice; and to the members of the staff of The Hospital for Sick Children, Great Ormond Street, for access to their patients.

UNOCCUPIED HOSPITAL BEDS

A FEW months ago a study group of the King's Fund Hospital Administrative Staff College issued its report on Hospital Bed Occupancy.[1] In a memorandum [2] to regional boards, management committees, and boards of governors, the Minister of Health has now drawn particular attention to points in the report which, it is hoped, will be a help in making a special review of methods of using hospital beds more effectively.

HOW BEDS ARE WASTED

Delay in Filling Vacant Beds

It has often been said that 80–85% of beds occupied is the best a general hospital can do; but some recent experiences have shown that a figure of over 90% is practicable. Beds are often kept vacant as a reserve against emergency calls: the memorandum suggests that every hospital should consider whether it is over-insuring for such contingencies and whether by working arrangements with neighbouring hospitals, or by other means, fewer emergency beds need be reserved.

Another cause of vacant beds is the too-rigid allocation of beds both to individual consultants and between male and female patients in the same specialty. Greater elasticity in the use of beds in different units of the hospital may help.

The memorandum adds that suitable patients might usefully be booked to come in on an agreed date. Waiting-lists should be regularly overhauled and all persons whose names have been on them over a certain length of time (or their doctors) should be asked whether the bed is still needed.

A vacant bed in a ward, the Minister emphasises, "should be considered a proper matter for enquiry by responsible medical and nursing staff, and the co-operation of ward sisters should be expressly sought."

Delay in Starting Treatment

When the patient has been admitted things can often be got going more quickly if he has been called to the outpatient department shortly before the day fixed for admission. At this consultation his condition can be verified, certain diagnostic tests can be set in train, and directions given for others to begin as soon as he is admitted. Some hospitals have found that many bed-days can be saved if anæsthetists hold special clinics for patients about to be admitted for operation, so that they can decide whether the patient is fit or whether operation should be deferred.

Delay in Discharge

Here the proper application of modern methods of rehabilitation can, the Minister feels, do the greatest good. The resettlement of the patient should be the concern of the almoner as well as the consultant from the start. The probable duration of stay (assuming nothing untoward occurs) can often be estimated quite early; and it should be known whether the patient will need help in resuming his normal life or in getting work.

The almoner, in coöperation with the family doctor or local health authority, should ascertain the patient's home circumstances, make provisional arrangements for home aftercare, and pass this information to the consultant. When a change of employment will be necessary the disablement officer of the Ministry of Labour should be consulted at an early stage, both to reassure the patient and to ensure that there is no delay in enabling the patient to maintain himself.

A patient whose re-employment or resettlement raises difficulties can often be more easily dealt with through a resettlement clinic—an informal meeting under the chairmanship of the consultant in charge of the case, or a consultant interested in rehabilitation, at which almoner, physiotherapist, occupational therapist, disablement resettlement officer, and, if necessary, a health or welfare worker from the local authority are present.

Consultants may be able to authorise a provisional discharge date, which can be later confirmed or postponed by a more junior member of the medical staff. The Minister here mentions the importance of telling the patient's doctor in good time when a discharge is imminent. A full report and advice should be sent to the doctor within a few days at most of the patient's discharge.

Inpatient or Outpatient?

The memorandum suggests that more investigations could be undertaken in the outpatient department rather than in the ward. Many patients could also be treated at home if the hospital gave help to the general practitioner by outpatient treatment, domiciliary consultation, and diagnostic, pathological, or radiological services. General practitioners should have free access to these services whenever possible; experience has shown that such a service throws little, if any, extra burden on the hospital departments concerned.

CONSULTATION BETWEEN HOSPITALS

Waiting-lists and turnover-rates show that the pressure on beds varies greatly between comparable hospitals and departments even in the same areas. It may sometimes be possible, for example, to arrange transfers from a hospital with a long waiting-list to one less heavily burdened. The Minister thinks there is much scope on this and similar lines for regional boards and management committees to arrange and encourage inter-hospital consultation to share out the work.

STATISTICS

To encourage the senior medical staff to be on the look-out for ways of using beds more effectively, they should be given a full and regular review of the position in a statistical form, perhaps with graphs. The Minister declares it is essential that an intelligible statistical summary should be put before the staff at regular intervals, for ready comparison preferably in some departmental form. Annual statistics for inter-hospital comparisons are of value, he adds, but much less so than statistics for individual hospitals and departments "regularly and frequently scrutinised as a means to local action."

The memorandum has been "generally endorsed" by the Standing Medical Advisory Committee and the Central Health Services Council.

1. See *Lancet*, Aug. 7, 1954, p. 277.
2. H.M.(54)89.

FREEDOM IN MENTAL HOSPITALS

The End and the Means

PATIENTS in different mental hospitals are permitted different degrees of freedom. In some hospitals there is much emphasis on the locking of all doors, in others the aim is to lock as few as seems possible or advisable. It is now being suggested that locks are unnecessary, and that when all doors are left open both patients and staff benefit from the change of atmosphere.

In the four mental hospitals described below the liberty of the patient is a matter of serious concern. All give patients far more freedom than would have been thought justifiable twenty years ago; and in one the experiment of keeping all doors unlocked is now being tried.

I

At Warlingham Park, Dr. T. P. REES, the physician-superintendent, has been a pioneer: for twelve years he has kept open all but 2 of the 23 wards in this 1020-bed hospital.

Patients of both sexes, whether voluntary or certified, come and go, meet each other at the canteen, and walk where they will in the grounds or through the open gate; and no harm (though much good) has ever come of it. Many patients, when questioned, date a turning-point in

their illness from a time when some patient of the other sex took a friendly or even sentimental interest in them; and Dr. Rees thinks that these emotional relationships, usually mild and transient, have an important part to play in the patient's recovery. The relationship of patients with the doctors and nurses is easy and natural: the nurses are thankful not to have to sustain the incompatible rôles of nurse and gaoler, and the patients have none of the resentment which comes of being confined.

The aim is to make the patient feel that he is part of a group, and one way to do this is to keep the groups small, and to place them under the care of only one or two nurses whom they come to know and trust. Even patients whose habits have deteriorated respond to this kind of personal attention: about a dozen of them will be gathered into one ward, and looked after by only two nurses—one being with them from 7 A.M. to 2 P.M. and the other from 2 to 9 P.M. They are given a full programme of work and play, so that the day is well and pleasantly occupied, and they are helped by their nurses to make regular visits to the toilet. The morale in a habit-training group is usually very high, both nurses and patients taking a pride in the improvement of the members.

The two locked wards in this hospital are used mainly for patients who persistently abscond. Few of them spend much of the day there, however: they are nearly all out and about, working in the grounds or the occupational-therapy department, and they attend entertainments and other social functions in the hospital. Weekly discussion groups among patients take place in every ward, including those that are locked. The opinions expressed at these meetings are outspoken, and have a therapeutic value of their own.

II

At Nottingham City (Mapperley) Hospital, with 1100 beds (and at present 1156 patients) Dr. DUNCAN MACMILLAN has the doors of all the wards open day and night. In the daytime it is possible to go all over the hospital and out of the gates without a key; but at night, though the inside doors remain open, the outer gates are locked.

The wards have a few side-rooms where patients having any serious emotional crises can be temporarily secluded, but these are used to a limited and decreasing extent. The system was introduced gradually, and Dr. Macmillan, who discussed each step with his charge-nurses before introducing it, says that the nurses are now convinced that the new arrangement is an improvement on the old. He believes that in an open hospital occupational therapy must take the place of the locked door; for patients who are busy with a congenial task are less likely to wander off than those who are idle and bored. He thinks, too, that occupational therapy should not be reserved for those fit to attend some centre elsewhere in the building: they should be able to get it in their own wards. Thus there is occupational therapy in progress in all the wards of this hospital.

He finds that, since the doors have been open, paranoid patients have been far less inclined to run away than they were when they were locked in: for locked doors insult their pride and are a challenge to their ingenuity. Chronic patients, who might be expected to wander away through the open gates, do not in fact venture far from their wards; when the doors were first opened most of them, after an exploratory look round, seemed disinclined to go far afield, and returned to the ward, the haven to which they were accustomed. Patients whose families live near the hospital sometimes walk out and go home; but it is easy for a nurse to go round and persuade them to return, usually within half an hour; and often their own relatives get them to go back. Depressed patients, likely to commit suicide, present special difficulties, which at Mapperley are overcome by treating them early—usually on the day of admission—with electroconvulsive therapy (E.C.T.) Since the doors have been open—that is, during the past two years—there has been one suicide: a woman went out and bought a bottle of aspirin tablets, all of which she swallowed on her return. Since she was on parole, however, this could have happened whether the doors had been locked or not.

III

Dingleton Hospital, Melrose, differs from the two just described in having no locked doors at all.

Dr. G. M. BELL has had the system working fully for four years. His hospital is small (418 beds). Not only are the wards unlocked but there are no locked rooms, since he claims that if a patient can be secluded in a locked room neither he nor his fellow patients can feel wholeheartedly that they are in a hospital, not a prison. The plan was introduced gradually; but Dr. Bell, unlike Dr. Macmillan, did not discuss it first with his charge-nurses—believing (with reason, they have since told him) that had he done so they would have refused to put it into action. The nurses, however, are now well pleased with the system, saying it is easier to work than the locked-door plan. Ward occupation is more informal at Melrose than at Mapperley: in the occupation centre formal activities are liberally arranged for those who want them, but many now find their own interests.

The most serious episode which has resulted from opening the hospital has been the behaviour of two young antisocial psychopaths who obtained a car by false pretences before the police caught them. At the court proceedings Dr. Bell recommended an approved school for the dominant partner, but asked to have the second boy back. The procurator-fiscal, the solicitor for the defence, and the parents all wished that the boy might be more closely watched in hospital; but Dr. Bell replied that this was not possible and that if they thought the boy wicked rather than sick they should send him to an approved school too. The court accepted his guidance.

Like Dr. Macmillan, Dr. Bell finds that his paranoid patients are no longer interested in escaping; moreover, they seldom talk about their delusions and seem to lose most of their hallucinations. He claims that depressed patients lose their suicidal tendencies after the clinical interview and admission to the ward; but he, too, takes the precaution of treating severe depressives at once with E.C.T.—usually within an hour or two of admission.

The great advantage of the open door plan, Dr. Bell holds, is that it uncovers the real illness, uncomplicated by symptoms artificially produced by confinement, frustration, and resentment, which are usually taken to be part of the psychosis.

IV

Some large hospitals, built on the villa principle, are able to achieve a compromise between the locked and the unlocked hospital, and claim that in this way they can offer the best of both worlds. The patient who is harmless to himself and others can be given complete freedom, whereas the depressed patient who might destroy himself, the uncertain patient, the patient passing through an episode of excitement, and the confused patient liable to wander away, can all be kept safely from disaster. An example of such a compromise is to be found at the Crichton Royal Hospital, Dumfries, of which Dr. PETER MCCOWAN is physician-superintendent.

Here each of the separate pavilions stands in its own garden, which is enclosed by a fence or hedge. Each pavilion houses 30–70 patients, and in it the rooms and common-rooms are all unlocked, and there is free access to the garden. If the pavilion contains suicidal, disturbed, or disturbing patients, the garden gate is locked; if it is an "open" pavilion, this gate too is open, and the patients have access both to the general grounds and to the outside world as well: there are no high walls or locked gates.

The success of this arrangement depends both on the full but considered use of modern physical methods of

treatment and on the skill of the psychiatrists in grading the patients and allocating them to appropriate pavilions. This does not mean herding all dangerous, aggressive, or dissatisfied people together to make one another more wretched: on the contrary, hostile and paranoid patients are exposed to the influence of a well-behaved majority. Of the thirty-five wards at Crichton Royal, nineteen are fully open, and the patients walk in and out as they would at a general hospital. The remaining sixteen wards are sometimes locked, sometimes open, depending on the type of patient currently in them. The pavilions housing the deteriorated "static" patients may be either open or closed; and the doctors are always discussing whether this ward or that could be turned from "closed" to "open" by the exchange of a small number of patients into another ward. Some patients in closed wards who need supervision at night or suffer from infrequent psychotic episodes are given ground parole; and many of the rest attend occupational therapy or gymnastic classes, work in the garden, or go on small errands to the hospital shop or dispensary.

The staff take pride in the fact that very few patients are kept in bed in the daytime—perhaps 20 at any one time out of the whole population of 1300. Locked single rooms are very rarely used, because they are very rarely needed for the control of patients.

* * *

It is perhaps relevant to note that Dingleton Hospital is less than half the size of the other three. What can be done successfully in a small hospital may be much harder to achieve in a large one.

NON-GONOCOCCAL URETHRITIS

A SYMPOSIUM on non-gonococcal urethritis was held under the auspices of the International Union against the Venereal Diseases and Treponematoses at Monaco from Sept. 21 to 24. Those attending from Great Britain were: S. R. M. Bushby, D. G. ff. Edward, A. H. Harkness, E. Klieneberger-Nobel, and R. R. Willcox.

The conclusions included the following:

Terminology

(1) The term non-gonococcal urethritis (N.G.U.) should be applied to all forms, whether acute, subacute, or chronic.

(2) The complex "Reiter's syndrome" should be known henceforth under the single clinical name of urethro-conjunctivo-synovial (U.C.S.) syndrome, and its study should be considered as forming part of that of N.G.U.

Epidemiology

(1) The prevalence of N.G.U. in man in some places is tending to approach, if not exceed, that of gonococcal urethritis.

(2) The incidence of N.G.U. does not appear to be influenced by race, region, time of year, or age or sexual habits of the patients.

(3) The incubation period is thought to be longer than that of gonococcal urethritis.

(4) Possibly certain activating causes, particularly drinking and sexual excess, may arouse infection due to the agent or agents of N.G.U. lying dormant in deep-seated foci (the prostate in particular).

(5) Persons with certain urethral malformations, in particular hypospadias, seem to contract N.G.U. with special frequency.

(6) Women, and in particular the partners of men with N.G.U., often show no visible lesions but may be healthy carriers of the agent or agents of N.G.U.

Ætiology

Many possible causes have been mentioned. Among them, infestation with *Trichomonas vaginalis* seems to give rise to a special clinical picture: ocular or articular complications are not seen in such cases. Apart from this cause:

(1) Cultures for pleuropneumonia-like organisms are often positive, but the rôle of these agents is not established.

(2) Inclusion bodies are sometimes found in the urethral cells, some with a special appearance recalling that of the viruses. Others are pleomorphic, and it has been suggested that these may be pleuropneumonia-like organisms.

(3) Certain bacteria or protozoa other than *T. vaginalis* have been observed in cases of N.G.U.

The following practical recommendations are made: (*a*) look for *T. vaginalis* at first by simple direct examination, but if this is negative use staining after fixation, and culture methods; (*b*) do not attach any practical importance for the time being to positive cultures for pleuropneumonia-like organisms or the presence of inclusions.

(4) It does not seem at present that the detection of fungi or of protozoa other than *T. vaginalis* need to be taken seriously into consideration. On the other hand, a more thorough study should be made of various bacteria, and an expert committee has been established for this purpose. Allergy would not seem to be involved, but ill-considered local treatment may play some part.

Examination of Patients with N.G.U.

(1) The gonococcus should be eliminated by smear and/or culture.

(2) Other bacteria should be sought by cultural methods.

(3) A search should be made for *T. vaginalis* as indicated above.

(4) Serological examinations should be made for the detection of syphilis.

(5) Routine urological investigations, such as massage of the prostate, should be carried out.

Treatment

(1) Where *T. vaginalis* is present, it is suggested that the usual local treatments be employed (e.g., acidification of the urine to a pH below 5, instillations or irrigations, massage of the prostate, destruction of the focus under the urethroscope).

(2) The tetracycline antibiotics are regarded as the most effective form of chemotherapy, but they should be employed with due care.

FELLOWSHIP FOR FREEDOM IN MEDICINE

THE annual meeting of the Fellowship for Freedom in Medicine was held in London on Oct. 30, under the chairmanship of Lord HORDER.

Dr. E. C. WARNER (hon. secretary) said that the evidence which the Fellowship had presented to the Guillebaud Committee emphasised the need to make the general practitioner the most important person in the health service and in looking after the sick; and the need to make every member of the general public realise his own responsibility for his welfare and health.

An innovation at the meeting was an address by Sir GUY LLOYD, M.P., on the layman's point of view. The N.H.S. Act, he suggested, had strayed far from the Beveridge conception of a national health service. The public was becoming restless and disgruntled, and the cost of the service continued to rise alarmingly. The patient pined for more of the human touch: instead, all too often, he found rushed and overworked doctors who had neither the time nor the inclination to wait and to listen. Was it any wonder that more and more of those who could afford to do so wanted to become private patients?

Dr. J. L. MCCALLUM, presenting the report of the B.M.A. relations subcommittee, said that the Fellowship believed that freedom would return to the profession when doctors owned the goodwill of their practices, for this would show that there was a point beyond which the Ministry could not go. He proposed a resolution reaffirming the meeting's belief in the return of the right to buy and sell the goodwill of medical practices. In seconding this resolution Dr. A. V. RUSSELL said that in advocating the return of goodwill the main object of the Fellowship was to resist a whole-time salaried service. It was perfectly obvious that a whole-time salaried service, under political control, would be introduced before long for the sake of political tidiness, and not because it was best for medicine. The Cohen report showed the profession the slippery slope down

which it was sliding to complete State control. The resolution was passed nem. con. with one abstention.

Dr. J. O. M. REES, who presented the report of the private practice subcommittee, said that objections to granting drugs for private patients centred around finance, but the Fellowship was certain that reasonable safeguards against overprescribing could be drawn up and he proposed a resolution to allow private patients to obtain drugs subject to the following sanctions:

"If a doctor be found to be prescribing extravagantly: (1) in the first instance a warning should be given; (2) if this was not effective a surcharge should be made, as under the regulations of the N.H.S.; (3) if the surcharge were not paid, and only in that event, the right to use E.C.10 should be withdrawn. Against this decision appeal could be made to the Minister."

The resolution was passed unanimously,

At the end of the meeting Lord HORDER spoke on the future work of the Fellowship. Some said that the Fellowship was fighting a lost cause, but it would be interesting to ask what might have happened in medicine if the Fellowship had not existed. He felt that the emphasis the Fellowship had laid on the importance of private practice in giving doctors an independent livelihood might well have induced the Minister of Health to say, at Blackpool, within the last few weeks, that private practice was, and always must be, an essential part of the health service of the country. Lord Horder was sure that the greatest stimulus to private practice would be given on the day that private patients were permitted to receive their drugs on the same basis as N.H.S. patients. The Fellowship would continue to press for this.

A MEDICAL MEMORIAL

A MOVING ceremony of dedication of a memorial to the medical men and women of the British Empire and Commonwealth of Nations who gave their lives in the second world war was held last Tuesday at the house of the British Medical Association in London. The memorial takes the form of four symbolic figures, designed by Mr. James Woodford, R.A., with the collaboration, of Mr. S. Rowland Pierce, F.R.I.B.A., and set round the fountain in the forecourt of B.M.A. House. These represent Sacrifice, Prevention, Cure, and Aspiration.

In his dedicatory address, the Archbishop of Canterbury spoke of the universal sacrifice made by those of the free nations who died in the war. If we think of this as a noble thing done in vain, he said, we are losing—as they did not lose—the fire and stuff of life. They died for a faith in comradeship and loyalty, and in the things which make men better than beasts. Does such a faith hold reality, or is it an illusion? If an illusion, how sad was this action of dedicating a memorial. If it was real, it was real because it was held by persons, and because all nobilities, if they are real, belong to persons. Are persons real, or trivial ephemera? If they are dust we raise a monument in vain. Doctors in the beastly occupation of war were doing only lovely and loving things; and those doctors commemorated in this memorial were taken in their ministry: themselves they could not save. But in their deaths they saw God in fellowship. These, the Archbishop said, are the realities in which we must walk if we would live. The dead bought for mankind with their lives a space for repentance, reform, and hope.

A memorial plaque was unveiled by Sir John McNee, president of the British Medical Association, and after the service of dedication wreaths were laid on the base of the memorial by Dr. E. A. Gregg, chairman of the B.M.A. council, and Dr. Annis Gillie, president of the Medical Women's Federation.

Parliament

Clean Food Bill in Committee

WHEN the debate in committee in the Commons reached the provisions of this Bill which deal with regulations as to food hygiene Mr. FREDERICK WILLEY moved an amendment to make the Government's powers mandatory rather than permissive. The Government had largely withdrawn from their original good intentions, and though he agreed that these matters could suitably be dealt with by regulation, he thought that Parliament would do well to define the matters on which Ministers should be obliged to make regulations. Mr. HEATHCOAT AMORY, the Minister of Food, gave an assurance that regulations would be made. But he pointed out that it had always been accepted as bad law to make it mandatory on a Minister to make regulations unless they were specified in complete detail. He urged that the Minister should be given discretion to make what regulations he thought fit. The amendment was negatived by 228 votes to 213.

Mr. Amory accepted amendments to include standards for drainage, water-supply, refuse disposal, and clothing among the requirements to be imposed for food premises. He also accepted an amendment, moved by Dr. BARNETT STROSS,

"for imposing requirements that every sanitary convenience situate in such premises shall be supplied with water through a suitable flushing appliance."

Dr. EDITH SUMMERSKILL moved an amendment to ensure that everyone who worked in the food industry should be medically examined and that those with infectious diseases, or carriers, should be prohibited from such work and compensated. Dr. CHARLES HILL, parliamentary secretary to the Ministry of Food, pointed out that the amendment might make it necessary to examine 180,000 people—a most expensive process. Moreover, if it was to be of value, it would have to be repeated regularly. The examination would have to be of a detailed bacteriological kind if it was to reveal a carrier. That was something too formidable, and not without difficulties of principle. They should proceed along the lines of the Infectious Diseases Regulations modified, as they might well be, by regulations to be made under this Bill. Such regulations would provide that if someone handling food became aware that he was suffering from one of a list of diseases he must give notice to his employers who must notify the medical officer of health. Machinery could be set going for compensation if he must discontinue work. The amendment was negatived by 231 votes to 208.

Dr. SUMMERSKILL moved an amendment to allow a regulation to be made

"for prohibiting spitting on premises where food is sold, or offered, exposed, stored or prepared for sale for human consumption, including any parts of such premises in which apparatus and utensils are cleansed."

Dr. HILL accepted the amendment.

Compensation for Industrial Diseases

In the House of Commons on Oct. 27 Mr. ERNEST MARPLES, parliamentary secretary to the Ministry of Pensions and National Insurance, moved that the Draft Pneumoconiosis and Byssinosis Benefit Amendment Scheme, 1954, be approved. Explaining the purpose of the scheme he recalled that certain people who contracted pneumoconiosis and byssinosis were not covered by the Industrial Injuries Act because they had not worked in the occupation after July 5, 1948. Nor were they eligible for workmen's compensation. The first attack on this problem was by the Pneumoconiosis and Byssinosis Act, 1951, which covered cases of total disablement and death. The 1954 Act enabled the Minister to formulate a scheme, such as the one now presented, to pay a flat rate of 20*s*. a week for proved cases of partial disablement.

One of the main difficulties in framing the scheme had been the recruitment of sufficient doctors with the special qualifications necessary to settle anything up to 40,000 claims, which might mean 20,000 clinical examina-

tions—nearly as many as the existing medical panels now carried out in a year. But the department had now secured 7 new whole-time doctors and some extra part-time doctors as well.

Mr. Marples then moved that the Draft Industrial Diseases (Miscellaneous) Benefit Scheme, 1954, be approved. This is a corresponding scheme for industrial diseases such as skin cancer, including mule-spinners' cancer.

Both motions were agreed to.

QUESTION TIME

Reductions in Price of Drugs

Mr. ARTHUR BLENKINSOP asked the Minister of Health whether he would make a statement as to progress made in securing reductions in the price of proprietary and non-proprietary drugs and medicines.—Mr. IAIN MACLEOD replied: I told the House in May that we had not been able to reach agreement on prices with the manufacturers in one group of proprietary preparations. Subsequently agreement for a reduction in prices was reached in the case of two of these preparations and doctors were asked not to prescribe the two others. Since then, at the request of the Association of British Pharmaceutical Industry, discussions have been proceeding on the general principles by which the prices of proprietaries should be regulated. Cost investigations of the secondary manufacture and compounding of non-proprietary preparations have not so far suggested that the general level of prices in this field is excessive, but the matter is still under discussion. The investigations into the cost of basic drugs are proceeding.

Neglect or Inefficiency in Hospitals

Sir WALDRON SMITHERS asked the Minister, in view of the fact that the total of compensation payments made by the National Health Service hospital authorities from July 5, 1948, to March 31, 1953, was £328,916, what disciplinary action had been taken against those concerned; and what steps he was taking to minimise neglect or inefficient medical or nursing treatment among those employed by his department.—Mr. MACLEOD replied: It is for the hospital authorities themselves to determine what, if any, disciplinary action should be taken against members of their staff who are found to have been negligent or inefficient and to take whatever steps seem best to them in the circumstances of their own hospitals to minimise the risk of such occurrences.

Group Practice Loans

In answer to a question, Miss PATRICIA HORNSBY-SMITH, parliamentary secretary to the Ministry of Health, said that 95 applications for loans from the Group Practice Loans Fund had been received. Loans had so far been approved in principle for 30 of these.

Exclusion from Medical Practice

In answer to a question, Miss HORNSBY-SMITH said that in England and Wales, between July 5, 1948, and June 30, 1954, 4 doctors and 25 dentists were excluded from practice in the National Health Service, and breaches of the terms of service were found in 573 cases involving doctors and 1622 involving dentists. Full publicity was given where a practitioner was excluded from practice, but in other cases the publication of names would not in her view be in the public interest.

Inclusion of Tuberculosis Nursing in General Training

In answer to a question, Commander T. D. GALBRAITH, joint under-secretary of State for Scotland, said that the General Nursing Council for Scotland have decided that tuberculosis nursing, for a minimum of 8 weeks, should in future be part of the training of a student nurse for State registration. This will apply to students entering training from January, 1956, unless excused for medical reasons. The Secretary of State welcomed the council's decision, for it would no doubt result in an expansion of the nursing force trained in the care of tuberculosis.

Merit Awards

Mr. BLENKINSOP asked the Minister of Health the number and value of merit awards for each year since 1948 for England and Wales classified by category of award, age, sex, and specialty of recipient, and the proportion of these awards granted to full and part time specialists respectively.—Mr. MACLEOD replied: Information is not available for the proportion of awards made to whole-time and part-time consultants respectively. The other information is being compiled.

Medicine and the Law

Liability for Pneumonia in Employee

IN an action heard in the High Court last month,[1] a colour and lacquer sprayer, aged 36, recovered damages from his employers on the ground that he had contracted pneumonia because the spraying-room in which he had worked was cold and draughty. Liability was denied.

Mr. Justice Cassels, giving judgment, said that in 1951 the defendants constructed new premises. In the spraying-room on the first floor there was an intake of air through two ventilators in a dividing wall, and an outlet low down in the windows in the outside wall. This was to comply with regulation 4(a) of the Cellulose Solutions Regulations, 1934. In September, 1952, the polishing shop was moved to the first floor, and the cellulose space partitioned off from it. The installation of heating was delayed. The plaintiff said that he was cold and suffered discomfort; there was a draught which whistled round him because, to get the proper light, he worked in the stream of air from the ventilators and extracting fan. He complained, and was told that it would not be so bad when the heating was on. On Nov. 7, when he reached home, the doctor diagnosed pneumonia and pleurisy.

His Lordship found that the plaintiff's workplace at the end of October and beginning of November, 1952, was cold, draughty, and—certainly in the early morning—damp. Section 3 of the Factories Act, 1937, required effective provision to be made for a reasonable temperature in each workroom in a factory. He thought that the defendants were in breach of that provision in the circumstances of the case. He further thought that their common law duty was to secure the installation of heating arrangements before the plaintiff was called on to work in October and November in the new spraying-room. He was satisfied that the plaintiff's illness was caused by the absence of heating, and he awarded damages totalling £401.

Public Health

Diphtheria Immunisation

IN a message to medical officers of health and others concerned in child-welfare work, Sir John Charles, chief medical officer of the Ministry of Health, hopes that they will continue to emphasise to the public that the elimination of diphtheria depends upon the maintenance of an adequate level of immunisation. Figures were disturbingly low: in 1952 31% of babies reaching the age of one had been immunised; in 1953 the proportion was 30·4%. Sir John points out that the hope has always been to immunise 75% of babies during their first year of life. To aid the campaign, the Ministry is offering to local authorities (among other things) a new poster, three cinema slides, and a new film strip for showing in welfare centres.

Virus Encephalitis in India

An investigation into the recent outbreak of virus encephalitis in north and north-east India is being made by the virus research centre of the Indian Council of Medical Research. A special laboratory has been set up in Jamshedpur, in Bihar, where virus encephalitis was first reported. Observations are also being made in Lucknow and Delhi. State governments have been advised to take measures directed against insects suspected of transmitting the virus.

Stockholm Health Survey

In Stockholm 3000 people, chosen at random, are to undergo a searching medical examination so that the general state of health in the city may be estimated. The examination will include X-ray investigation of the lungs, heart, and digestive system, electrocardiogram, and certain laboratory tests. A statistical analysis of the findings will then be made.

1. *Times*, Oct. 19, 1954.

In England Now

A Running Commentary by Peripatetic Correspondents

IT falls to some of us to serve Her Majesty in the Armed Forces for two weeks a year in a Territorial or Reserve capacity. With a sense of self-sacrifice we leave the rigours and long hours of our medical practice and plunge into an exacting round of military duties. During a brief respite from my arduous life, my family visited me and we parked the car beside a road near the camp. Notices announced that the area nearby was used as a mortar range and that visitors should take care. I duly warned my children, but one, unknown to me, was out of earshot. We admired the scenery and looked in vain for the Dartford Warbler which has become rare owing to an understandable distaste for tanks, which have competed successfully with it as denizens of this part of the country. Our reverie was rudely disturbed by an inquiry from my small son as to the nature of an object he had brought to show us. At a glance this proved to be an unexploded mortar bomb. To suppress a look of abject horror in such circumstances is well-nigh impossible without practice, and such was our look of horror that he hurled the bomb to the ground to be rid as quickly as possible of the object that caused his parents so much displeasure.

I can only suppose that the lack of explosion was due to a combination of damp and a dispensation from the Almighty.

* * *

It has been an expensive lesson, but one we all must learn—a case of automobile hypochondriasis with a fatal disease.

The constant aura of rattle, knock, squeak, and bang had become a subconscious background that I regarded as normal to a 1932 car. Crossing the Pennines at 4 A.M., bound for Scotland, perhaps the knock did sound a little strange, unfriendly, and not one of the family. But I thought "Aha! you can't fool me. Just a bit of piston slap; on we go." I put my foot down, and on we went—for a few hundred yards, until we ground to a shuddering, quivering halt. As they say in cardiological circles, it was a grade-5 machinery murmur; a definite *bruit de diable*. "Yes" said the garage man "£45, it'd cost, sir. 4 big ends, front and rear main-bearings, new crankshaft and . . ." It fetched £10 as it stood—a smoking useless necrotic mass by the roadside.

Now I have a virgin new car, but I'm lonely. I miss the friendly clatter, the smell of exhaust fumes, the doors flying open on corners, and I've nearly had my head through the windscreen three times because the car slows down when I press the brake pedal. I miss especially the sympathetic, understanding nods and waves of motorists in old vehicles. Now I'm just classed as "a doctor who must be making thousands, because he's got a new car." I pay the second instalment next month—I hope.

* * *

I visited my old sanatorium the other day and was admiring the new occupational-therapy unit, with its motto "Boredom has no place in a Sanatorium," when my old chief walked in. I don't think I've ever seen him so upset; more so, even, than when his favourite patient, the five-stage thoracoplasty, absconded with the ward's Christmas funds and then wrote to ask for an insurance line.

"Smith is taking an irregular discharge," he announced dramatically. We murmured condolences, though I could see little reason for his chagrin. Irregular discharges are common enough in sanatorium practice. "You don't understand," he continued, "it's why he's going that's important. He's cracked the foundations of modern sanatorium practice—undermined my life's work, that's what he's done."

Apparently after the weekly patient-staff meeting Smith, who represented his ward, had informed the chief that he was going home.

"It's like this, sir," said Smith. "All we used to do was get up. Then in the morning we tidied up the ward and waited for the doctor, and in the afternoon went for a walk. Now we've got occupational therapy classes and physiotherapy classes, and when we're not doing deep breathing we're making toys. We've got the staff meetings once a week and the pictures twice a week. We've got a whist drive once a fortnight, and a brains trust once a month, and when the weather's good bus-runs to the seaside. The local football club's adopted us and they visit us once a week and give us a concert. The *Daily Crier*'s given us a television set, and when we haven't special permission to sit up late it's a scramble to see as much as we can before Sister packs us off to bed. And then there's the billiards and darts competitions, sir, and the welfare workers who visit us, and the church workers, and the mobile shop, not to mention our weekly refills and the demonstrations to the students. Now, sir, you say we've to get a celebrity lecture every Friday. To tell you the truth, sir," Smith finished, "I can't stand the pace. I'm going home for a good rest."

* * *

Prayer of a seven-year-old grandson: "God bless grandad and help him to kill the germs and not the patients."

* * *

From In England Now, Sept. 23, 2054, p. 713.

I have just returned from an exciting week in Padua, where Signor Antonio is developing a promising extension of his world-famous refrigerator plant. So far we have only used refrigeration in the operating-theatre; in Padua it is used not only in physiological research but also in the treatment of disease. From the day of Weir Mitchell, rest has been recognised as of little value in the treatment of mental and nervous disorder, and much of the success of prolonged narcosis is due to the use of abreaction and suggestion. The psyche does not sleep. Antonio, by a skilful combination of light narcosis and low temperatures, has turned man into a hibernating animal for as long as ten weeks. In this state, it appears, the "roof-brain" is truly dormant, and the hypothalamus is in control. Hence a remarkable degree of physiological cerebral rest is achieved. Much further research is needed, but it is believed that after a minimum of six weeks' refrigeration abnormal patterns of ideation and behaviour disappear. Judgment and memory are unimpaired when cortical dominance is re-established, but many dysgenic emotions and impulses, presumably of recent origin and therefore eradicable, are eliminated.

The restoration of normal temperatures is necessarily gradual, and this requires a series of temperature chambers: in the first, respiratory function is re-established; in the second, great care is taken to see that the integrity of the cardiovascular system is fully restored; in the third, a full diet is given (with particular attention to fat and protein deposition) and metabolic functions are assessed; while in the fourth, a new re-integration of the personality is attempted. In this fourth room the therapeutic trend is towards positive measures, for the prolonged depression of cerebral enzymatic activity appears to allow earlier and healthier habits of thought to emerge. The patient rapidly recapitulates his emotional experiences, and professional actors and actresses are introduced into the room to personify the mother, father, siblings, school-teachers, girl and boy friends (conventional sexual modes are readily impressed), and spouse(s). It appears that a new and recognisable persona is emerging—Refrigerator Man—in whom an adult maturity is combined with the charming gaiety of childhood.

The physician will be more interested in the discovery that the refrigerating process appears to suspend permanently the abnormal enzymatic activity which is responsible for such diseases as acute rheumatism, rheumatoid arthritis, chronic nephritis, and the miscellaneous group misnamed in the last century the collagen diseases. This dissociation of effect upon the physiologically and the pathologically active enzymes may well prove important. A more sinister, but not unexpected, consequence of these researches is that the N.A.T.O. general staff has become interested. It has proved possible in the recovery-chambers to indoctrinate volunteers so profoundly that they become resistant to all the methods for destroying the personality which have been elaborated in the last thirty years.

Opportunities for study leave in the Mediterranean countries have hitherto been limited; but the refrigeration plant in Padua now provides an admirable reason for a journey to Italy.

Letters to the Editor

THROMBOPHLEBITIS FOLLOWING INTRAVENOUS INFUSIONS

SIR,—Thrombophlebitis following intravenous infusions, though only occasionally mentioned in the medical press, is a painful and troublesome condition constantly with us. The impression left by the section on this subject in Dr. James's article of Oct. 16 is that thrombophlebitis is due to several factors, a not unimportant one being the inexpert technique of the new houseman.

My own observations, made over 3 years in three London hospitals, are summarised below and lead me to believe that the technique of the operator is a comparatively minor factor which should not deflect attention from others which are more significant.

(1) The condition is common. In a survey carried out at the North Middlesex and St. Bartholomew's Hospitals in 1952–53 the limbs of 56 patients who had received electrolyte solutions intravenously for more than 12 hours, through standard giving sets, were examined. 2 days after the infusion had stopped 34 showed severe thrombophlebitis, which meant that many patients had an acute cellulitis from wrist to elbow.

(2) The setting up of drips by those experienced in intravenous work and the regular use of good splintage and blunt (Frankis Evans) cannulæ has not been found to reduce the incidence of thrombophlebitis. This suggests that various forms of mechanical injury to the vein are not alone responsible.

(3) In spite of the severity of some of the reactions to intravenous infusions, which spread far outside the vein wall, I have never seen suppuration ensue, so the inflammation is almost certainly not bacterial in origin. Further, if 'Polythene' cannulæ are passed some distance up veins, thrombophlebitis starts at the cannula tip and not at the site of skin puncture.

(4) This last observation suggests that the fluid entering the vein is irritant. The irritant substance may be in the bottle of fluid itself or come from the giving set through which the fluid passes. Here it is worth noting that thrombophlebitis is much more common after infusions of crystalloid solutions than after blood. One reason for this is that blood-transfusions rarely continue for more than a day, whereas drips maintaining fluid balance in surgical patients often last 3–4 days. (This must, I think, explain the experience of Dr. James's senior pathologist: he may give some blood-transfusions but it must surely be a rare event for him to set up and maintain an intravenous drip in a surgical ward.)

Whether the acid reaction of sterile glucose solutions is partly responsible for this higher incidence remains to be proved.[1] Thrombophlebitis is sometimes seen after transfusions of blood alone. The fact that it can occur with the infusion of any type of fluid suggests that there is no specific irritant in the various fluids prepared for intravenous use. It is now believed that the irritant is dissolved out of the rubber tubing of the giving set as the fluid passes slowly through it to the vein. The evidence for this has been clearly presented by Handfield-Jones and Lewis.[2]

My own observations at St. Bartholomew's Hospital last year confirm this. In November, 1952, the high incidence of thrombophlebitis in the surgical wards led me to make a number of giving sets equipped with Baxter latex rubber tubing. They differed in no other way from the sets issued by the regional transfusion depot save that the servicing was done in the hospital. These latex sets were used on one pair of surgical wards and the ordinary red rubber sets on another pair. The following observations were made on patients receiving intravenous infusions—mainly 1/5 normal saline with 4·3% dextrose solution—for more than 12 hours:

	Latex	*Red rubber*
No reaction	19	5
Thrombosis	2	2
Mild thrombophlebitis	4	4
Severe thrombophlebitis	0	15
Total	25	26

Of these 51 drips, 15 ran for more than 48 hours. 11 of these 15 were latex drips and in 7 of them no reaction occurred. These results strongly suggest that red rubber tubing differs from latex tubing in having some constituent which causes thrombophlebitis when in prolonged contact with veins.

There are difficulties which prevent the use of latex tubing by the Blood Transfusion Service, but a new tubing, "6819" has been introduced which is believed to contain fewer irritant chemicals. Recent experience with this tubing shows that, though it looks like ordinary red rubber tubing, it causes fewer reactions. These are however still prevalent, for nearly 50% of our patients who receive intravenous infusions for more than 12 hours have a moderate or severe degree of thrombophlebitis. This compares unfavourably with the results obtained with the latex sets, but it shows that modification of the composition of rubber tubing can reduce the incidence of thrombophlebitis and suggests the lines along which further work should proceed.

Central Middlesex Hospital, London, N.W.10. P. F. JONES.

ARTIFICIAL FEEDING OF INFANTS

SIR,—I read with great interest the article in your issue of Oct. 23 by Dr. Hytten and Dr. MacQueen.

I have noticed over six years in infant-welfare clinics that babies rarely thrive on National dried milk if the directions on the tin are adhered to. If a baby of (say) one month is not gaining sufficient weight and is emptying all its bottles, my usual advice to the mother is to follow the directions on the tin for a two-month baby. If it is still not satisfied, I tell her to increase the feed to that for a three-month baby, and so on until the baby leaves a little behind in the bottle. As the baby grows the feed is increased, always following his appetite, not the directions on the tin but not making the mixture more concentrated than one scoop to the fluid ounce. I have never seen one of these babies suffering with overfeeding. The only overfeeding I have met is in babies starting on solids, who are stuffed with carbohydrates.

Most babies thrive well on full-cream milk from birth. There are, however, some infants that seem unable to tolerate the fat of dried milk and who suffer with abdominal distension and vomiting and do not gain weight. These babies do very well on the half-cream milk with patent barley added to make up their calorie requirements. They will usually take full-cream milk no better at one month than at birth and need to be kept on the barley mixture. When they are started on cereals at four months, they usually tolerate these made with whole, undiluted fresh milk with no trouble.

Half-cream milk should certainly be supplied only on medical recommendation—it usually is where the milk is bought at a clinic.

As to the directions on the full-cream tins, would it not be better to give directions for the strength of solution and instruct the mother to give the baby as much of this solution as it will take? This is the way a breast-fed baby feeds. Conscientious mothers are so overwhelmed by tables that they tend to regard their babies as little machines that work a set number of miles to the gallon. I met one mother recently breast-feeding her baby who was so worried that the child was getting too little or too much that she was drawing her milk off with a breast pump and giving it to the child in a bottle!

Wednesbury, Staffs. HAZEL B. BAKER.

SIR,—I was interested in the article by Dr. Hytten and Dr. MacQueen and in their conclusion that the instructions issued to mothers for preparation of artificial milk mixtures should be revised. I should like to suggest that only the proportion of milk powder to water should be stated on the tin, and not the theoretical requirements

1. Page, B. H., Raine, G., Jones, P. F. *Lancet*, 1952, ii. 778.
2. Handfield-Jones, R. P. C., Lewis, H. B. M. *Ibid*, 1952, i, 585.

according to age or weight. These are averages based on observations of a large number of babies. It is better that the mother should base requirements on primary factors, chief of which are her baby's appetite and bowel action.

As the result of some experience in infant-welfare centres I find that, if mothers are instructed in the principles of feeding, they can discover the requirements of their respective babies. If, on the other hand, rigid orders about quantity are given by the "tin" or some doctor or nurse, then the mother usually runs into trouble.

Such is the awe of the doctors, books, and tins that I have seen partially starved babies, whose only fault is that they required more than their mothers dared to give them. The more courageous of such mothers have at most given surreptitiously a little sugar and water, thinking that they can thereby pacify the baby, and avoid the wrath of doctor or nurse.

Even if instructions in preparing dried milk are corrected and correctly followed, there will still be some babies requiring more than the average, and it is for this reason that I plead that tables of quantities should be omitted from tins, and provided in any other form only if it is stressed that they are no more than a rough guide.

Withyham, Sussex. PETER DUPRÉ.

FORCEPS DELIVERY OF THE AFTERCOMING HEAD

SIR,—In a normal vertex delivery the maintenance of full flexion of the fœtal head on the trunk is essential to permit the smallest diameters of the skull to pass through the pelvic outlet. During the delivery of the aftercoming head of a breech through the outlet the trunk and shoulders have already escaped from the birth canal and flexion and extension of the cervical spine can occur freely within moderate limits without influencing the position of the fœtal skull in relation to the mothers' pelvic outlet and birth canal. Figs. 1–4 of Mr. Ostry's article last week illustrate this point.

There can be no doubt that the application of forceps to the aftercoming head of a breech serves as protective cage, facilitates slow, controlled intermittent traction, and permits the establishment of respiration before delivery is completed. Forceps avoid the dangers—associated with the Prague and Mauriceau-Smellie-Veit manœuvres—of fractured clavicle and jaw, hæmatoma of the sternomastoid muscle, dislocation of the cervical spine, brachial-nerve palsies, and tearing of the buccal mucosa.

Following the application of forceps in the conventional manner beneath the trunk of the fœtus, traction is applied to the head in the axis of the birth canal. The perineum and exposed portion of the fœtal face is kept in view throughout delivery. The upper respiratory passages can be aspirated as soon as the mouth becomes visible and respiration is thus established at least five minutes before the delivery is completed.

In the method described by Mr. Ostry the forceps are applied above the trunk and behind the occipital condyles and thus the forceps themselves cannot increase flexion of the head in relation to the birth canal. The fœtal trunk is flexed on the head which remains uninfluenced in the birth canal. When traction is applied to the forceps much of the force is expended against the back of the symphysis pubis and thus to effect a comparable descent of the head a much greater force must be applied. The presence of the fœtal trunk hanging downwards over the perineum will in addition prevent aspiration of the respiratory passages until the head has been completely delivered, and this will reduce the time available for the slow delivery of the head. In a personal series of 52 breech deliveries and extractions with 1 fœtal death, in which the Mauriceau-Smellie-Veit manœuvre was used, I have been perfectly satisfied by the method of forceps application first described by William Smellie in the 18th century.

Guy's Hospital, London, S.E.1. J. M. HOLMES.

MENOPAUSAL MOTHERS

SIR,—The interesting article in your issue of Oct. 23 (p. 862) by Dr. Stokes and his colleagues prompts us to comment that physical symptoms can be overshadowed by psychological complaints in child-guidance clinics as well as in mental observation wards.

Bonham Carter [1] has noted that thyrotoxic mothers may complain of their babies' insomnia, which is cured when the mother's illness is diagnosed and treated.

We would like to mention some of the problems of mothers at the menopause. They complain of the nervousness or bad behaviour of their children. The maternal attitude of rejection and overprotection is clear to the therapist, though often difficult to treat. Unless, however, one asks the mother specifically about her own physical symptoms, a useful short-cut in treatment of the family problem is missed.

Her expressed anxiety about the child may cover a worse anxiety—carcinophobia, following irregular vaginal bleeding. Menopausal menorrhagia can cause severe anæmia (disguised by make-up) which makes the mother lethargic and unable to cope with a lively child. Hot flushes, also unmentionable, further increase her malaise and irritability with the child. These symptoms can be cured by curetting, iron, and ethinyl œstradiol; and the resultant well-being of the mother makes it much easier to discuss the child's management profitably.

Nowadays we inquire directly of mothers over 40 about menopausal symptoms; and we also often lend them a readable pamphlet [2] on this subject, before taking the children on for psychotherapy.

St. Thomas's Hospital, London, S.E.1. RICHARD MEYER
JOAN NICHOLSON.

RED HALF-MOONS

SIR,—Dr. Terry's observations on the incidence of red half-moons in cardiac failure (Oct. 23) were of great interest to me.

My attention was first directed to red moons in a patient with carcinoma of the bowel, and subsequent investigation (carried out on the medical service of the Edward J. Meyer Memorial Hospital, Buffalo, New York) revealed a high incidence of red moons in individuals with malignant lesions of various origins. In fact, I believe that red moons of the thumb-nails are the rule in malignancy rather than the exception. Enthusiasm for the diagnostic significance of this sign, however, soon waned because the condition was discovered (as Dr. Terry notes) in a variety of systemic diseases.

Dr. Terry has described the appearance of the discoloured nail carefully and well. I agree with his observation that it becomes more common with advancing age, and I believe that an extension of his present series will reveal a more nearly equal sex-incidence.

Red moons are rare in normal individuals. The incidence found by me in 4500 apparently healthy adults was approximately 0·2%. These were seen in a cancer-detection clinic serving 1500 persons annually. A physician friend of mine has had red half-moons for ten years during which he has enjoyed perfect health. In my experience, however, a red moon in health never has an irregular distal edge obliterating the normal landmarks of the moon.

The optical genesis of the moon was demonstrated to me in a case of acute pulmonary osteo-arthropathy in which a normal moon first became red (as the angle of

1. Bonham Carter, R. E. *Lancet*, 1947, i, 465.
2. "Medica," Change of Life. London, 1949.

the nail was lost due to elevation of its proximal edge) and finally completely disappeared when clubbing was well advanced.

Department of Experimental Medicine, University of Cambridge. JOHN W. BOYLAN.

SIR,—Dr. Terry suggests that the normal appearance of a white half-moon is due to a light-reflecting surface between the nail and nail-bed, which are less firmly adherent in the half-moon area than elsewhere.

In the toe, even in a limb exsanguinated and with a tourniquet applied, the white half-moon is always clearly evident on the matrix after the nail has been avulsed, and it is used as a guide to the distal limit of excision of matrix in the operation for removal of nail and nail-bed I favour at present.[1] On the few occasions when I have used this operation on the fingers, the same appearance has been seen.

The reason for the whiteness of the normal half-moon must therefore be sought rather deeper than Dr. Terry suggests.

Neville's Cross, Durham. THOMAS A. BERRY.

RUSSIA REVISITED

SIR,—I should like to support Dr. Alex Comfort's view that the figure of 50 years, which he has supplied to Dr. Fox, who quoted it, cautiously, as the expectation of life in the Soviet Union, is now too low. The increasing welfare and good health of the people were evident during our visit everywhere, and this impression was supported by figures of declining trends in the mortality and incidence of such important diseases as tuberculosis and malaria, which were given to us by the deputy minister of health in Moscow.

The figure for the crude death-rate in the Soviet Union is also known. It was 8·9 per 1000 in 1953, and this compares with 13·2 in France, 11·4 in the U.K., 9·6 in the U.S.A., and 9 in Japan. The Russian figure was given by Mr. A. I. Mikoyan to the Supreme Soviet of the U.S.S.R. on April 25, 1954, and it serves as further indirect evidence of a rising expectation of life, although a proper comparison between the above figures cannot be made in the absence of information on the age distribution of the populations in the respective countries.

London, S.W.16. L. CROME.

ENDOMYOCARDIAL FIBROSIS

SIR,—The recent correspondence on this subject prompts me to bring to notice what appears to be the earliest description of the condition in Africa yet to be recognised. In 1915 Macfie [2] described a case of occlusion of the left ventricle as follows:

"The patient, who had been receiving treatment for a septic leg, died suddenly one morning under a tree in the hospital compound. He had complained of no other symptoms of illness except the condition of his leg.

At the autopsy the right lung was found to be solid with pneumonia, and some yellow purulent-looking fluid was present in the right thoracic cavity. The left lung was normal.

On examining the heart, both auricles were found to be greatly distended, but especially the left one which was ballooned out enormously. On incision the left ventricle was found to be almost entirely filled with a dense white clot which was firmly adherent to the walls of the ventricle. The cavity was entirely filled but for a tiny space at the base not more than half an inch in diameter."

A photograph of the heart accompanied the report.

Medical Research Institute, Accra, Gold Coast. M. M. HUGHES.

1. Zadik, F. R. J. *Bone Jt. Surg.* 1950, **32B**, 66.
2. Macfie, J. W. S. Report of the Accra Laboratory for the year 1914. London, 1915; p. 23.

INCOMPLETE PITUITARY INSUFFICIENCY

SIR,—With great respect, I wonder whether Dr. Wilson and his colleagues (Oct. 30) may have inadvertently transposed the algebraic signs when reporting the normal control range for the basal metabolic rate, so that instead of reading "minus 5% to plus 15%," it should read "plus 5% to minus 15%." In a large series of normal controls, including the age-group of their cases, I found that, when applying my results to the standards of Aub and Du Bois, the range was approximately plus 1 to minus 23. I believe other investigators in this country have found not dissimilar results to mine.

West London Hospital, Hammersmith, W.6. J. DOUGLAS ROBERTSON.

LUMBAR-PUNCTURE HEADACHE

SIR,—In their paper of Oct. 2 Dr. Gallagher and Dr. Campbell stress the usefulness of a 20 ml. intravenous injection of 30% saline solution in the treatment of headache after lumbar puncture.

The importance and advantages of hypertonic solutions for this purpose—especially after spinal anæsthesia—was emphasised in a paper to which I contributed in 1930.[1] We recommended the rectal administration of 30 ml. of 50% magnesium-sulphate solution, or the intravenous injection of 2 ml. of the same solution, for headache after spinal anæsthesia (which occurred in about 10% of more than 6000 spinal anæsthesias). Sometimes, however, another lumbar puncture was necessary and useful 2 or 3 days later.

Budapest. ENDRE MAKAI.

SELF-INDUCED EPILEPSY

SIR,—In your annotation of Oct. 16 you comment that only recently have the clinical implications of photic stimulation been recognised. It is of interest that Apulius, in his Apologia quoted by Temkin,[2] states: "The rotation of a potter's wheel before slaves' eyes would make the epileptic feel giddy and might be the cause of a seizure"; and this is described as a test for ascertaining the health of a slave before sale. It seems that there is nothing new under the photic lamp.

The practical implications of photic stimulation can be dangerous. I have seen cases where epilepsy has been induced by the flicker of a propeller against the evening sun, by the stimulation to a motor-cyclist of the lights in the Mersey tunnel passed at critical speed, and by the effect of bicycling through the shadows caused by cemetery railings. It seems likely that at some future date induced convulsions may be a hazard of helicopter passengers.

Wembley Park, Middlesex. VICTOR TOMPKINS.

MOTOR-CYCLIST'S PTOSIS

SIR,—Though a layman in medical science, I read Dr. Penman's letter of Oct. 23 with great interest and unaccustomed understanding.

Having only this month completed 3000 miles' motor-cycling on the Continent in about three weeks, I was perturbed to find toward the end that, similarly, my left upper eyelid tended to droop and sometimes flutter. This condition continued for several days after the completion of the tour. Since, however, I was wearing goggles for at least three-quarters of that time, I was uncertain myself whether it was due to the pressure of the goggles around the eye, when in use, or, as Dr. Penman suggests, to their absence during the shorter period—this latter period incidentally being in the main on night runs, when glare becomes somewhat aggravated by the use of goggles.

Usk, Monmouthshire. ADRIAN F. H. ARNOLD.

1. Koster, H., Makai, E. *Chirurg.* 1930, **2**, 1082.
2. Temkin, O. The Falling Sickness. Baltimore, 1945.

PERIARTERITIS NODOSA

SIR,—I am prompted by your excellent and informative leader of Oct. 2 to emphasise some points in the ætiology of the condition, which I made some years ago.[1]

There would actually appear to be multiple conditions now described under the name of periarteritis nodosa, the one common feature being the presence of widespread necrotising arteritis.

The true condition as described by Kussmaul and Maier [2] in 1866 affects the small and medium-sized arteries and is marked by the naked-eye appearance of tiny white tubercle-like lesions in the acute phase, and aneurysm and thrombus formation at a later stage. Whereas there are many conditions which may give necrotising arteritis in different parts of the body, it is my belief that the condition as described by Kussmaul and Maier has a specific ætiology and it, and it only, should be given the name of periarteritis nodosa or possibly polyarteritis nodosa acuta. In it the small artery or arteriole has its whole circumference involved in any part of its course, but in the medium-sized artery the lesion appears to be eccentric. This was described in 1907 by Dickson, [3] who noted a slight bulge at the site and concluded that this signified early aneurysm formation; but serial sections show that the apparently eccentric position of the lesion is due to the disease involving a branch at the point where it arises from the main vessel, the aneurysm-like bulge being the beginning of its lumen.

In some cases where an artery divides into two branches the parent vessel is free of disease, but the branches themselves show the necrotic process, again starting at their points of origin. A similar distribution of the necrotising lesions was described in a form of rheumatic lung.[4]

The presence of leucocytic infiltration at the site of the lesion has led to confusion, and it was actually at one time believed because of this that the condition was of infective origin. However, serial sections show that the necrosis occurs in the first instance without any leucocytic response, which is a secondary phenomenon. Moreover, the lumen of the vessel tends to be markedly increased at the site of the necrosis, suggesting a bursting from within as the cause. It is also noteworthy that only the arteries are involved, the veins never. The true pulmonary circulation is not involved: thus a section of lung may show a normal pulmonary artery lying adjacent to a diseased bronchial artery (which belongs to the systemic circulation).

A similar condition may be seen in a section of liver where a necrotic hepatic artery may lie next to a normal portal vein and bile-duct. Conversely, it has been shown [4] that there is a type of rheumatic lung in which a necrotising arteritis closely resembling periarteritis nodosa occurs and involves the pulmonary circulation to the exclusion of the systemic one. Sections have also shown that there may appear to be a second attack of the condition while the primary one is showing evidence of healing by fibrous proliferation, and in these cases the necrosis may be found in the subintimal proliferating fibrous stroma and not in the remnants of the media, again suggesting that the cause is pressure acting from within the lumen.

A study of the reported cases of periarteritis nodosa demonstrates that in a great many of them the blood-pressure is much higher than normal and the heart frequently hypertrophied. It has been suggested by some that any rise of pressure has been due to the renal ischæmia associated with the condition, but in most cases the evidence suggests that the hypertension and cardiac condition have preceded, and not followed, the arteritis. Thus it appears probable that the arterial lesion of periarteritis nodosa is of traumatic origin and due to actual bursting of the walls of the artery, owing to a rapidly rising blood-pressure. Similarly, when lesions of necrotising arteritis are confined to the pulmonic circulation they are probably due to an increase of pressure in that circulation due to left heart-failure, or back-pressure from mitral stenosis.

The question of course arises as to which part of the arterial system will suffer damage in such a sudden rise of pressure in the systemic circulation. The larger vessels are well supported with their musculo-elastic elements, while the smallest vessels subserve a wide vascular bed so that pressure in them will be low. Thus it would appear justifiable to believe that the small and medium-sized arteries, the ones involved in periarteritis nodosa, would be the ones most likely to suffer. This view also corresponds to the presence of the lesion at the beginning of a branch, where, of course, the pressure will be highest.

Can this theory be reconciled with the work of Selye on the "diseases of adaptation"? He has shown that the production of corticoids increases the body's resistance to stress-producing agents; but where there is an excessive or unbalanced production of mineralocorticoid, the process may derail and the primarily useful general-adaptation syndrome become the cause of disease—the so-called collagen diseases, which include periarteritis nodosa. It has been found experimentally that an animal may be "sensitised" to the action of mineralocorticoid—for example, by a high-salt diet or unilateral nephrectomy. A significant feature of the experimental work carried out by Selye has been an associated rise in blood-pressure. Thus he mentions [5] that animals overdosed with deoxycortone (a mineralocorticoid) reproduce "the experimental equivalent of certain hypertensive rheumatic and allergic diseases of man—in particular, malignant nephrosclerosis, necrotising arteritis similar to periarteritis nodosa, as well as intense and persistent rise in arterial blood pressure." There may therefore be grounds for suggesting that Selye's experimental work gives added weight to the theory that the lesions of periarteritis nodosa can be attributed to a rapid rise of blood-pressure.

The Royal Infirmary, Greenock. A. LYALL.

THE SMALL-LIST PRACTITIONER

SIR,—Why has the small-list practitioner over the age of 60 to *apply* for the new remuneration? His age, the size of his list, and surely the length of his residence in the district are known to the paying authorities. I thought the regulation was meant to put an end to a gross injustice: instead it looks as if it is to be "given" as a kind of charity. Nobody applied for the Danckwerts addition. Why should we?

OVER-60 SMALL-LIST PRACTITIONER.

ISONIAZID AND P.A.S.

SIR,—So many of us are groping for a satisfactory regimen of chemotherapy for prolonged treatment of tuberculosis that the paper by Dr. Joiner and his colleagues in your issue of Oct. 2 must attract attention, though the significance of the results quoted is perhaps not altogether clear. What is disappointing in this, as in some other papers, is the failure to describe clearly the dose of the drugs used. 250 mg. of isoniazid may be given as a single dose or may be divided. 10 g. of *p*-aminosalicylic acid (P.A.S.) has been split into two doses or four in different Medical Research Council trials; which method was used here? There is only an oblique suggestion that it may have been the former.

There is much uncertainty about the value of methods other than those so far proved satisfactory by the M.R.C. trials [6 7]; and these, involving daily injections, are not acceptable for very long periods. What seems probable is that the efficacy of P.A.S. is related to the peak blood concentration obtained four times, thrice, or perhaps

1. Lyall, A. Thesis, University of Glasgow, 1938.
2. Kussmaul, A., Maier, R. *Dtsch. Arch. klin. Med.* 1866, **1**, 484.
3. Dickson, W. E. C. *J. Path. Bact.* 1907, **12**, 31.
4. Lyall, A. *Glasg. med. J.* 1947, **28**, 127.
5. Selye, H. *Brit. med. J.* 1950, ii, 1129; *Ibid*, 1951, i, 203.
6. *Ibid*, 1952, i, 1157.
7. *Lancet*, 1953, ii, 217.

even fewer times daily. Authors should therefore be precise in describing dosage.

Apart from this it is certain that the peak concentration obtained in the blood is related to the form in which P.A.S. is exhibited. Absorption is most rapid when solution or cachets are used, it is slower when coated granules or tablets are given. Mention of the data on this point also might be made to the great advantage of the reader, who would then be in a position to assess the paper in relation to his own practice.

St. Wulstan's Hospital, Malvern. T. W. LLOYD Physician-superintendent.

*** Dr. Joiner and his colleagues reply: "Isoniazid was given as 50 mg. tablets, 1 t.d.s. and 2 nocte. P.A.S. was given in cachets, each containing 1·5 g. of sodium salt: 3 cachets were given in the morning, 2 at midday, and 2 in the evening, with milk or water as desired."

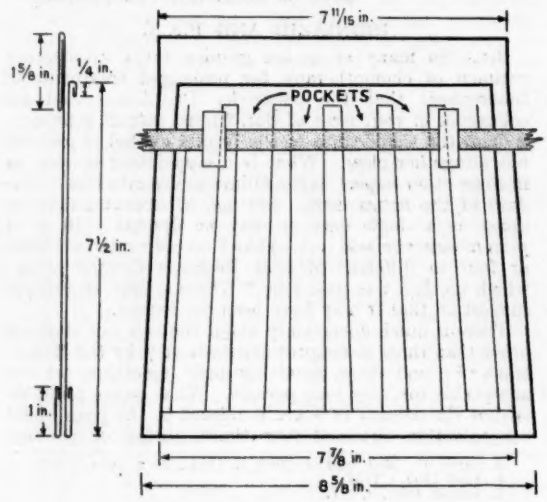
AN INFANTILE-ECZEMA JACKET

SIR,—One of the problems in treating infantile eczema is to stop the baby from scratching. A method commonly recommended is to wrap corrugated cardboard round the elbows, which prevents the child from bending its arms, and so keeps its hands away from its face and other affected parts. The disadvantage of using cardboard, as I discovered when my infant daughter suffered from the complaint, is that sooner or later the child works its arms free. My husband and I, after experimenting with various devices and materials, constructed a restraining jacket which proved entirely satisfactory. It can be made at home, and a description of it may be useful.

The bodice is of strong, washable, cotton twill—one yard of 28-inch material is sufficient—hemmed at the neck and round the lower edge, and fastening in front with tapes. The bodice has "arms" about 1 in. long, which are not hemmed: when the jacket is made up, each "arm" is inserted between two layers of material forming the sleeve, and machined.

The sleeves are splinted with strips of vulcanised fibre (such as is used in making suitcases): this is non-corrodible, light in weight, and does not cut through the material. Six strips, each 7 in. long, $^1/_2$ in. wide, and about $^1/_{16}$ in. thick, are used for each sleeve, and fit into $^3/_4$ in. wide pockets made by stitching the two layers of material together.

After hemming, the dimensions of the sleeve are as in the accompanying figure, which also shows the position of the pockets for the fibre strips. The sleeve seam is best sewn up by hand; the pockets for the strips are machined. To hold the strips in place, a flap of the inner layer is turned over the outer layer and sewn with cross-stitch: as this stitching has to be undone to remove the fibre strips when the jacket is washed, I used coloured sewing twist so that I know which thread to cut. Before the strips are inserted their corners should be slightly rounded. Tapes are sewn securely to the wrists of the jacket so that the child's arms can be pinioned to its body.



The jacket is worn over other clothes, and can be easily removed if the child is old enough to feed itself.

Papworth Everard, Cambs. BARBARA NEWNHAM.

A WORD WANTED

SIR,—There have been several suggestions, some through your columns and others direct to me, in response to my inquiry [1] for an antonym to *retrospective*. *Antespective*, which was proposed by Miss Jean Husted (Oct. 9), is the one I like best. It sounds well and, though a new word, it sounds respectable. Moreover, it does, I think, suggest the opposite of surveying past events. Perhaps one day a scientifically inspired Pope will write of a "Sage with *antespective* eye."

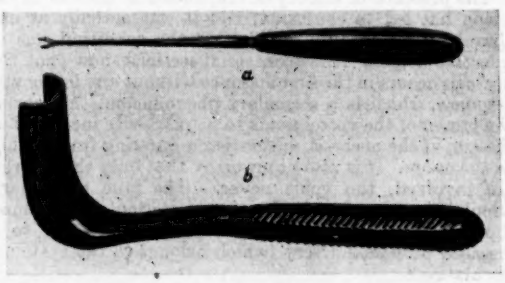
Bristol Royal Hospital for Sick Children. JOHN APLEY.

TWO USEFUL GYNÆCOLOGICAL INSTRUMENTS

SIR,—The two instruments in the accompanying figure are:

(*a*) A Negus "knot-tier."
(*b*) An old discarded Sims speculum, which has had the terminal lip sawn off.

These two instruments are ideal for inspecting the vagina and for cleaning up with gauze swabs after colporrhaphy.



The knot-tier is used to poke gauze in and has the virtue of not pulling it out again as does a dissecting forceps. The absence of the terminal lip to the Sims speculum is invaluable when packing the vagina, for this instrument will not disturb the pack on being withdrawn.

London, W.1. KEITH VARTAN.

BRONCHIECTASIS OR Q FEVER?

SIR,—May one who celebrates his fortieth year with tuberculosis next month and therefore has a considerable amount of fibrous tissue in his bellows relate this experience.

Last April, three days after a rigor, he produced four ounces of purulent sputum, bloodstained, yea, even unto anchovy sauce, an evening temperature and night sweats, and he endured all this for over four months. No tubercle bacilli were found on culture, nor was the illness in any way influenced by streptomycin and isoniazid. He was dubbed and damned as a bronchiectatic. Two months ago he took by mouth aureomycin, 250 mg. six-hourly for four days only, and thereafter quickly returned to normal. At the time of writing he is as dry as a well-behaved three-year-old or a volume of Victorian sermons, and very active. He makes this statement because the medical officer of the company that manufactures aureomycin tells him that similar cases have not been reported.

1. *Lancet*, 1954, i, 784.

Without a scrap of other evidence he finds it hard to dissociate this experience from the amazing fact that on the evidence of the blood of blood-donors it is clear that some 3% of the population in this part of the country, the south-east, have been infected by the virus of Q fever.[1] Brother Bronchiectatics, note well! As there is a convention that condemns exposing one's own meat in the market-place, I subscribe myself

"SAMUEL BUNG."

ASSESSMENT OF RHEUMATOID ARTHRITIS

SIR,—It would appear, from the letter by Dr. Copeman and Dr. Savage in your issue of Oct. 30, that "the otherwise very complete initial clinical examination" and follow-up series, carried out by the Guy's group in assessing the progress of a case of rheumatoid arthritis, was marred because a trained and skilful physiotherapist examined and assessed joint movement.

Considering the modern training in physical medicine, I can think of no-one better qualified to carry out the task of examining an arthritic joint, with regard to either active or passive movement, than an experienced physiotherapist. How discouraging it must be for the physiotherapist concerned to read how his or her efforts in the team are disparaged by other members of the medical profession.

Wallington, Surrey. A. BARRETT-BOYCE.

MEGALOBLASTIC ANÆMIA AND ANTICONVULSANT THERAPY

SIR,—In our letter last week, describing instances of megaloblastic anæmia in epileptic patients who had been taking phenytoin, we omitted, by an oversight, to mention the important fact that the first patient had free hydrochloric acid in his gastric juice. It was this, indeed, that led us to the more elaborate investigations we recorded.

In contrast, the second patient has now had two alcohol-histamine test-meals performed, both in relapse and in remission, and shows complete achlorhydria. As we stated, her condition resembles a true pernicious anæmia.

St. George's Hospital, London, S.W.1. J. N. MARSHALL CHALMERS
K. BOHEIMER.

A HELP UP STAIRS

SIR,—The accompanying sketch shows a simple device that may help to overcome the difficulty that some rheumatoid patients with affected knee-joints experience in mounting stairs. A patient known to me has for years managed exceedingly well with this device, which her masseuse turned out for her.

It consists of a block of wood, in which has been inserted a light wooden handle. A block by itself has been used before, and this makes a half stair which stiff legs can usually manage; but the addition of the handle is a great advantage and an extra support to the patient.

Painswick, Gloucestershire. JOAN WEST.

1. Stoker, M. G. P. *Brit. med. Bull.* 1953, 9, 232.

INSULIN TRIALS

SIR,—In your issue of Oct. 16, Dr. Paley draws a clinical comparison between insulin-zinc suspension (I.Z.S.) ('Lente') and soluble insulin plus protamine-zinc insulin (1 : 1), using the technique of Izzo and Crump. His conclusion is: "The new insulin-zinc suspensions—amorphous, crystalline, and mixtures—appear to suffer from the same limitations as do other insulin preparations." On this we wish to make the following comments.

Four patients were selected from the diabetic population because of their instability, and thus considered suitable for insulin trials. It should be noted that the four patients were females aged 31 or over. Children and juveniles were not included though they form a rather important group in insulin therapy. Case 1 cannot be properly classified as an unstable case (I.Z.S. in this case showed the smoothest action). Case 3 was excluded from comparison because of hypoglycæmic reactions when I.Z.S. was administered (due perhaps to better utilisation of insulin). Of the remaining two cases a more satisfactory action of I.Z.S. was seen in the one but not in the other (even when two injections of insulin-zinc suspension amorphous were given later).

From this trial it would seem more reasonable to conclude that four cases are insufficient for the evaluation of the clinical properties and limitations of I.Z.S.

Novo Terapeutisk Laboratorium, Copenhagen. K. HALLAS-MØLLER
M. JERSILD
K. PETERSEN
J. SCHLICHTKRULL.

Obituary

HAROLD HERBERT SANGUINETTI
M.A., D.M. Oxfd

Dr. H. H. Sanguinetti, emeritus pathologist to the National Temperance Hospital and consulting pathologist to the Belgrave Hospital for Children, died in London on Oct. 12, at the age of 82.

He was educated at University College School and Wadham College, Oxford, where he graduated with honours in natural science in 1894. He continued his medical studies at St. Thomas's Hospital, qualifying in 1897 and taking his B.M. the following year. After serving at St. Thomas's as house-surgeon and assistant in the pathological department he became senior house-surgeon to the North Staffordshire Infirmary. From 1902 till 1909 he practised at Minehead, where he was also for some years medical officer of health. After he moved to London he soon acquired a large general practice in Kensington, and was also able to satisfy his main interest by holding appointments as pathologist to the National Temperance Hospital, the Belgrave Hospital for Children, and All Saints' Hospital. As he was a diabetic his repeated attempts to serve in the 1914 war met with no success, but in the late war, during the blitz, he looked after his patients and the pathology and transfusion services at the Temperance Hospital in exemplary and cheerful fashion. During a period of inactivity enforced by ill health he wrote his thesis for the D.M., which he received in 1924. In his busy life he found time to attend regularly the meetings of the Hunterian Society and the Medical Society of London, and he wrote not only for the medical journals but also for *The Spectator*.

A colleague writes: "Perhaps the chief formative influence of Dr. Sanguinetti's life was his three years at Oxford during a brilliant period in the 'nineties about which he had many stories, and the flavour of which remained evident in all his writings and in his witty after-dinner speeches. He was always a great champion of the general practitioner and was himself a shining example as his many patients would testify. He married Miss Alice Cash, and their four daughters were a great support to him during the nineteen years he was a widower."

Notes and News

O & M

SOME thirteen years ago the Treasury's investigating section was expanded and renamed the Organisation and Methods Division. Since then O & M has come to be the accepted title for a systematic study of an organisation with a view to improving its efficiency and economy. Many large Government departments and public corporations have started O & M units, and their experience suggests that smaller authorities would also benefit from this kind of help. Last July the Ministry of Health [1] set up a small advisory unit, and many hospital administrators who wish to know more about the technique will find enlightenment and reassurance in Mr. Raymond Nottage's booklet [2] which includes a discussion of its application to the hospital service. He recognises the danger that a Ministry O & M service might well be regarded as another device for securing tighter financial control, and he suggests instead that each regional hospital board might set up a unit to advise its management committees, while the Teaching Hospitals Association might have a similar unit for the 36 boards of governors. The annual cost of such units would probably range from £5000 to £10,000—"a modest expenditure in relation to the scope for possible savings," Mr. Nottage holds, when it is considered that the annual expenditure of the boards ranges from £6 million to £30 million. Hospital authorities will probably place even greater stress than does Mr. Nottage on the need for the O & M unit to win the confidence of those whose work it is investigating.

KEEPING THE CHILD AT HOME

FOR some time it has been realised that a child should almost always be kept in his own home with his own mother, even when both fall short of perfection. In practice [3] families are still separated, and children sent to institutions and parents to prison, often because more effective forms of help are not available. This discrepancy between theory and practice is both unsatisfactory and expensive, and more money spent helping a family when it was still in difficulties rather than in trouble, would pay handsome dividends in happiness, efficiency, and cash. The need to develop the preventive side of welfare work was lately discussed by a child-welfare officer in the *Observer*.[4] The London County Council shares this concern, and as an experiment is appointing two child-welfare officers who will each concentrate on a small number of troubled families and mobilise all forms of help so as to keep them together. When a family has to be temporarily separated the officer's aim will be to re-establish it as quickly as possible. The Family Service Units already offer concentrated personal help of this kind, and their results are encouraging. But the success of the technique will depend on finding enough people with the right training and character for this exacting though rewarding work.

THYROGLOBULIN METABOLISM

ADDRESSING the Manchester Medical Society on Oct. 13, Dr. H. Jackson said that failure to cure patients with highly differentiated adenocarcinoma of the thyroid gland is sometimes due to the reappearance of iodine-concentrating tumour cells despite repeated therapeutic doses of radioactive iodine. Alternatively, differentiated tumour cells subsequently grow which fail to accumulate radioactive iodine. The destructive effects of radioactive iodine in the thyroid gland are followed by the appearance of radioactive thyroid protein (thyroglobulin) in the plasma. By a method recently described by Brown and Jackson, together with combined chromatography and radio-autography, the relative proportions of this material, thyroxine, and iodide may be estimated in man and animals. The disappearance of the labelled thyroglobulin from plasma is usually accompanied by the liberation of thyroxine and iodide. But thyroxine only may appear, or on the other hand no detectable radioactive breakdown products may be found.

These findings led to a study of the metabolism of radioactive thyroglobulin in laboratory animals. The results so far suggest that for the removal of homologous thyroglobulin from the blood there is a highly specific and rapid mechanism in which the liver and spleen are mainly concerned. Heterologous thyroglobulin, however, disappears much more slowly, with little or no liberation of thyroxine. Furthermore, repeated injections of such thyroglobulin results in an immune reaction, which has not been observed with the homologous thyroid protein.

1. See *Lancet*, July 17, 1954, p. 148.
2. Organisation and Methods in the Smaller Public Authority. London: Royal Institute of Public Administration, Haldane House, 76A, New Cavendish Street, W.1. 1954. Pp. 22. 2*s*. 6*d*.
3. See *Lancet*, Sept. 11, 1954, p. 537.
4. *Observer*, Oct. 23, 1954.

SOME EARLY NECROPSIES

Antonio di Paolo Benivieni (1443–1502), a Florentine physician, has been called one of the founders of the science of pathology. His fame rests on his little-known Latin book *On some hidden and remarkable causes of disease and recovery*, now admirably translated by Prof. Charles Singer.[1] In it Benivieni describes in delightful style more than a hundred of his cases. Sometimes the diagnosis is clear today, but often there is insufficient information. Occasionally he is puzzled though the answer is clear to the reader:

"I saw a woman . . . who ejected a great many worms . . . like melon seeds. These worms were all joined together hanging on to one another by their teeth. As their chain was more than four cubits long it looked like one body and only one worm."

But the main interest in the book lies in the casual details of post-mortem examinations in fifteen of the cases. They are described as though a necropsy was a normal procedure; in fact on one occasion when permission was not granted Benivieni is clearly surprised. Here again the truth eludes him occasionally, as in this case of "stones found in the coat of the liver:"

"I then had her dead body cut open. There were found in the lower part of the membrane round the liver, a collection of small stones varying in shape and colour. Some were round, some pointed, some square. . . . These stones by their weight had caused the membrane to hang down in a bag a palm's length and two fingers wide."

On other occasions he seems to have been triumphantly correct:

"Hardening of the stomach. My kinsman, Antonio Bruno, retained the food he had eaten for too short a time, and then threw it up undigested. He was most carefully treated with every kind of remedy for the cure of stomach trouble but as none was of any use at all, his body wasted away through lack of nourishment till little more than skin and bone remained. At last he was brought to his death. The body was cut open for reasons of public welfare. It was found that the opening of his stomach had closed up and it had hardened down to the lowest part with the result that nothing could pass through to the organs beyond, and death inevitably followed."

Dr. Esmond Long has written an interesting biographical appreciation.

BARRIER SUBSTANCES

BARRIER substances are widely used in industry to supplement other measures for preventing dermatitis from contact with skin irritants. The barrier substances subcommittee of the Codex Revision Committee has been investigating the possibility of producing suitable standard formulæ for a range of protective preparations of this type for inclusion in the *British Pharmaceutical Codex*. The following four preparations have been selected for trial and comment:

Dust barrier	
Casein (rennet, finely powdered)	3
Sodium alginate	2
Glycerin	6
Stearic acid	10
Triethanolamine	1·55
Chlorocresol	0·2
Phenol	0·5
Distilled water	to 100

Oil and solvent barrier	
Kaolin (sterilised)	20
Bentonite	3
Hard soap (powdered)	12
Glycerin	6
Stearic acid	2
Sodium chloride	1
Chlorocresol	0·2
Phenol	0·5
Distilled water	to 100

Water barrier	
Hard paraffin	25
Soft paraffin	1·75
Liquid paraffin	3·5
Cetostearyl alcohol	5
Triethanolamine	0·7
Stearic acid	1·8
Chlorocresol	0·2
Distilled water	to 100

Skin-conditioning cream	
Monostearin, self-emulsifying	10
Glycerin	6
Triethanolamine ricinoleate	1
Wool alcohols	6
Chlorocresol	0·2
Oleyl alcohol	3
Distilled water	to 100

A suitable non-irritant perfume may be added to any of the formulæ.

Correspondence concerning these preparations should be addressed to the Secretary, Barrier Substances Subcommittee, 17, Bloomsbury Square, London, W.C.1.

1. The Hidden Causes of Disease. *De Abditis Nonnullis ac Mirandis Morbonum et Sanationum causis*. ANTONIO BENIVIENI, translated by CHARLES SINGER. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1954. Pp. 216. 50*s*.

University of Cambridge

On Oct. 30, by 252 votes to 192, the members of the regent house accepted the senate's recommendation that the retiring age for members of the university staff should be advanced from 65 to 67.

University of Aberdeen

On Oct. 27 the degree of M.D. was conferred on E. G. Hardy.

National University of Ireland

University College, Dublin.—The following appointments have been made: Dr. M. D. Hickey, lecturer in medical jurisprudence, Dr. Patrick Meenan, lecturer in bacteriology, Dr. Colman Saunders, lecturer in pædiatrics, and Dr. J. W. Harman, lecturer in pathology.

Royal College of Physicians of London

At a comitia of the college held on Oct. 28, with Sir Russell Brain, the president, in the chair, Sir John Charles, Dr. R. E. Smith, Dr. J. C. Hawksley, Prof. M. L. Rosenheim, and Prof. W. Melville Arnott were elected councillors; Sir Harold Boldero was re-elected representative on the committee of management; Sir Russell Brain, Sir Harold Boldero, Prof. W. G. Barnard, Sir Allen Daley and Dr. A. M. Cooke were re-elected members of the standing joint committee of the three Royal Colleges; Prof. C. A. Keele was appointed representative on the Poisons Board. Dr. R. S. F. Schilling was appointed Milroy lecturer for 1956.

The following, having satisfied the censors' board, were admitted to the membership:

M. K. Alexander, M.B. Lpool, G. H. Apthorp, M.B. Lond., Don Jinadasa Attygalle, L.M.S. Ceylon, P. A. J. Ball, M.B. Camb., E. H. Brown, D.M. Oxfd, Elizabeth H. Buchanan, M.B. Birm., G. F. M. Carnegie, B.M. Oxfd, P. M. Daniel, M.B. Camb., D. M. Davies, L.R.C.P., W. G. Davies, M.B. Camb., Anil Kumar Dutta, M.B. Patna, Mahmoud Mohamed Moustafa Elmishad, M.B. Cairo, Eileen E. Hill, M.B. Glasg., J. A. Hill, M.B. Lond., J. B. L. Howell, M.B. Lond., Maurice Kessell, M.B. Adelaide, F. D. Kitchin, M.B. Lpool, W. G. H. Leslie, B.M. Oxfd, D. J. McBrien, M.B. Lond., T. P. H. McKelvey, M.B. Camb., lieut.-colonel R.A.M.C., Althea G. Matthews, M.B. Lond., R. C. Michell, M.B. Lond., captain R.A.M.C., J. N. S. Mitchell, M.B. Glasg., squadron-leader R.A.F., Madeleine B. Morris, M.D. Lond., D. N. Phear, M.B. Camb., Constance M. Ridley, B.M. Oxfd, Honor M. V. Smith, M.D. Lond., André Swanepoel, M.B. Cape Town, G. R. Tudhope, M.B. St. And., Edith Wahl, M.B. Lond., J. A. Weaver, M.D. Belf., David Wise, M.B. Camb., A. C. Woodmansey, M.D. Leeds.

Licences to practise were conferred upon 102 candidates who have passed the final examination of the conjoint board:

Fadl Muhammed Abu-Laban, Inez R. Aldous, D. W. Atkinson, Roy Barker, Norma A. Beardwell, D. C. Bland, J. N. Bodger, P. S. Boyne, Peter Brine, Susan M. Broadbent, D. G. Bromham, D. V. Burke, N. R. Burt, P. G. T. Bye, T. A. Carlisle, J. F. Catchpool, Margaret A. Clark, G. B. Clarke, J. R. Cobbett, B. B. Collins, A. F. Conchie, Sonia Davis, V. A. Edwards, T. H. English, M. D. Enoch, Sheelagh F. Evans, E. D. Falla, H. P. L. Falla, Edith R. Fieldus, Lorna O. A. Fletcher, Hamish Forbes, I. U. Fraser, A. M. Freeman, J. S. Garfield, E. F. D. Gawne, Claudia M. B. Grigson, Alfred Halamandres, Elizabeth W. Hall, Olga R. Harbron, T. F. Hebblethwaite, D. B. E. Hennessy, R. T. M. James, Stefania J. Jaron, Gemunu Wijeyenanda Karunaratna, B. D. Kay, P. R. L.-C. Lam-Po-Tang, Sidney Lazarus, W. M. Lennox, I. V. Longfield, G. E. Lovatt, N. C. McGill, S. M. Madeloff, A. R. Mainwaring, Roy Malley, J. W. Maltby, Richenda M. Martin, B. J. Mead, A. V. K. Meehan, W. K. Merifield, R. J. S. Milton, R. J. R. Moffat, L. P. Moore, C. I. Morgan, Kathleen C. Morton, M. T. C. Mower, N. H. Moynihan, V. A. Ngu, P. E. I. Nwabuoku, F. A. Olapade, P. J. J. O'Neill, R. T. Pagan, G. D. Parbrook, Catherine Parry, John Parry-Jones, Helen J. Pegg, J. K. Radnor, G. S. Rawson, M. J. Ree, E. G. Reynard, P. C. G. Reynolds, C. J. Rhodes, Ethel A. Richardson, D. J. Roberts, I. R. Robertson, Gordon Ross, S. M. Ross, J. B. Ryder, A. A. Said, Werner Schulte-Frohlinde, Monica Shackleton, A. J. Shaw, I. S. G. Sim, J. P. S. Slatter, I. I. Snobar, B. H. Strangways-Dixon, J. S. Sugden, R. C. Taylor, Pauline M. A. Thomas, P. B. Thompson, A. J. G. Timmins, J. G. Weyland, B. R. Wheeler, Sheila A. Wood.

Diplomas were conferred on those named in the report of the Royal College of Surgeons in our issue of Oct. 23 (p. 875). A diploma in public health was also conferred on R. N. Mitra.

Dr. C. E. Newman will deliver the FitzPatrick lectures on Tuesday and Thursday, Dec. 7 and 9, at 5 P.M., at the college, Pall Mall East, S.W.1. He is to speak on the Evolution of Medical Education in the Nineteenth Century.

Kettle Lecture

On Wednesday, Dec. 8, at 5 P.M., at St. Bartholomew's Hospital, West Smithfield, London, E.C.1, Prof. E. J. King, D.SC., will give this lecture. He is to speak on Infective Experimental Pneumokoniosis.

International Diabetes Congress

The International Diabetes Federation is to hold a congress at Cambridge from July 4 to 8, 1955, under the presidency of Sir Lionel Whitby. Further particulars may be had from the congress office, 152, Harley Street, London, W.1.

Centenary Tribute to Florence Nightingale

On Oct. 26, at the Royal College of Surgeons, a reception was held to commemorate the arrival of Florence Nightingale at Scutari. On the invitation of Sir Arthur Howard, treasurer of St. Thomas's Hospital, and of Miss M. J. Smyth, matron and superintendent of the Nightingale Training School, a large company attended to meet the Ambassadors of France and Turkey. Many relics of Miss Nightingale were shown, and in a speech of welcome Sir Arthur Howard spoke of her immense services as a reformer after she returned from the Crimea—"half a century of creative effort unequalled by any woman and equalled by few men." He mentioned that a St. Thomas's nurse has been seconded to Istanbul, where she is now working as superintendent of the Red Crescent school of nursing; and he also said that a plaque in honour of Miss Nightingale is to be placed in the barracks at Scutari where she worked.

British Congress of Obstetrics and Gynæcology

This congress will take place in Oxford from July 27 to 30, 1955. Further particulars may be had from the secretaries of the congress, Radcliffe Infirmary, Oxford.

Nutrition Society

On Saturday, Nov. 20, at 10.15 A.M., at the Middlesex Hospital, London, W.1, this society is holding a symposium on the National Food Survey of Great Britain.

Society for the Study of Fertility

The next annual conference of this society will be held at the Hospitals Centre, Birmingham, on Thursday and Friday, June 23 and 24, 1955.

British Association of Sport and Medicine

This association is holding a meeting at 5.15 P.M. on Monday, Nov. 15, at the Westminster Hospital Medical School, London, S.W.1, on the Heart in Athletes.

University College of the West Indies

Dr. J. D. Arneaud has been appointed lecturer in morbid anatomy, Dr. E. H. Back senior lecturer in pædiatrics, and Dr. Rosemary Huxley-Williams assistant anæsthetist.

Robert Roesler de Villiers Foundation

This foundation is again offering awards for contributions to "the knowledge and treatment of leukæmia and allied diseases." Papers should be submitted before Oct. 20, 1955. Further particulars can be had from the office of the foundation, 1172, Park Avenue, New York, 28, N.Y.

Association of Surgeons of Great Britain and Ireland

The annual meeting of this association will be held in Glasgow from April 14 to 16, 1955. Subjects chosen for discussion include Diagnostic Procedures in Obstructive Jaundice and the Treatment of Occlusive Vascular Disease. Further particulars may be had from the hon. secretary of the association, 45, Lincoln's Inn Fields, London, W.C.2.

Anglo-French Exchange Bursaries

Applications are invited for bursaries to be awarded in 1955 to young British doctors under the exchange scheme arranged by the French Embassy in London between the Institut National d'Hygiène in Paris and the Ciba Foundation in London.

The value of the French grants is 60,000 francs a month, tax-free, and they will be awarded for periods of two to four months to doctors who wish to obtain clinical experience or carry out research in France. Since the aim of the exchange is to spread in each country knowledge of achievements, outlook, and methods in the other preference will normally go to candidates who are in teaching, or in posts where they can pass on the experience they have acquired. Application forms may be had from Dr. G. E. W. Wolstenholme, Ciba Foundation, 41, Portland Place, London, W.1. The closing date for applications is Feb. 5, 1955.

Association of Industrial Medical Officers

This association will celebrate the 21st anniversary of its foundation by holding an anniversary meeting in London from Sept. 25 to 29, 1956.

The *Proceedings of the First World Conference on Medical Education*, which was held in London in 1953, have now been published. (London: Oxford University Press. 1954. Pp. 804. 60s.)

The address of the Voluntary Euthanasia Legalisation Society is now 17, Victoria Street, London, S.W.1, and Mr. R. S. W. Pollard has taken over the secretaryship.

Diary of the Week

NOV. 7 TO 13

Monday, 8th

SOCIETY OF APOTHECARIES OF LONDON, Black Friars Lane, E.C.4
4.30 P.M. Dr. F. S. Cooksey: Conservative Management of Painful Arthritis.
5.45 P.M. Mr. H. Lyon-Campbell Wood: Surgery of Painful Arthritis.

INSTITUTE OF CARDIOLOGY
9.30 A.M. (National Heart Hospital, Westmoreland Street, W.1.) Dr. R. E. Bonham-Carter: Endocardial Fibro-elastosis.

INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, W.C.1
5.30 P.M. Dr. Helen Dimsdale: Papilloedema and Papillitis.

Tuesday, 9th

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Prof. G. M. Wilson: Electrolyte and Metabolic Response to Trauma.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Psychiatry.* Dr. M. Roth, Dr. H. Rollin: Trends in North American Psychiatry.

ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Prof. C. Scott Russell: Interpretation of Clinical Data.

INSTITUTE OF DERMATOLOGY, St. John's Hospital, Lisle Street, W.C.2
5.30 P.M. Prof. R. H. S. Thompson: Enzyme Systems in the Skin.

CHELSEA CLINICAL SOCIETY
8.30 P.M. (Rembrandt Hotel, Thurloe Place, S.W.7.) Mr. Lawrence Abel, Sir Stanford Cade: Cancer and Quacks.

OXFORD UNIVERSITY
5 P.M. (Mathematical Institute, Parks Road, Oxford.) Mr. P. Armitage, PH.D.: Sequential Tests for New Drugs and Vaccines.

MANCHESTER MEDICAL SOCIETY
8 P.M. (Medical School, Manchester.) *Surgery.* Mr. Norman Guthkelch: Congenital Malformations of Neurosurgical Importance.

Wednesday, 10th

SOCIETY OF APOTHECARIES OF LONDON
4.30 P.M. Dr. E. R. Cullinan: Liver Disease and its Treatment.
5.45 P.M. Dr. C. J. C. Britton: Allergic Disorders.

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
2 P.M. Dr. Barbara Clayton: Laboratory Investigation in Endocrinology.

ROYAL SOCIETY OF MEDICINE
4.30 P.M. *Physical Medicine.* Dr. D. F. O'Neill, Dr. P. E. Sundt, Dr. Ernest Fletcher, Dr. W. S. Tegner: Psychogenic Rheumatism.
8.30 P.M. *Proctology.* Mr. E. G. Muir: Rectal Prolapse. (Presidential address.)

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
3.30 P.M. Dr. Macdonald Critchley: Neurology of Old Age.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. H. Haber: Histopathology of Mesenchymal Tumours of the Skin.

HARVEIAN SOCIETY, 11, Chandos Street, W.1
8.15 P.M. Dr. Raymond Daley: Cardiac Valve Movement.

OXFORD UNIVERSITY
5 P.M. (Radcliffe Infirmary, Oxford.) Prof. Frederick Heaf: Advantages and Disadvantages of B.C.G. Vaccination. (Litchfield lecture.)

MANCHESTER MELICAL SOCIETY
4.30 P.M. *Pathology.* Dr. F. Duran-Jorda: Eosinophil Cell. Dr. K. V. Lodge: Non-specific Œsophagitis.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, Edinburgh, 2
5 P.M. Dr. Adam Patrick: the Enteric Fevers 1800–1920. (Sydney Watson Smith lecture.)

Thursday, 11th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. Dr. F. H. K. Green: Clinical Evaluation of Remedies. (Bradshaw lecture.)

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Dr. Robert Merle d'Aubigné (Paris): Reconstruction of Joints by Grafts or Prostheses. (Robert Jones lecture.)

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. Dr. J. D. Judah: Enzymes in Injury.

ROYAL SOCIETY OF MEDICINE
5 P.M. *Ophthalmology.* Mr. K. C. Wybar: Vascular Connections Between the Retina and the Choroid. Mr. D. A. Langley: Blood Osmotic Pressure and Ocular Tension Relationships in Glaucoma Simplex.

ROYAL ARMY MEDICAL COLLEGE, Millbank, S.E.1
5 P.M. Sir William Penny, F.R.S.: Explosions.

ROYAL EYE HOSPITAL, St. George's Circus, S.E.1
5.30 P.M. Dr. T. H. Whittington: Binocular Vision.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. R. W. Riddell: Significance of Yeasts in Skin Infection.

ALFRED ADLER MEDICAL SOCIETY, 11, Chandos Street, W.1
8 P.M. Dr. E. N. Snowden: Prevention of Psychoneurosis on a National Scale.

LIVERPOOL MEDICAL INSTITUTION, 114, Mount Pleasant, Liverpool
8 P.M. Dr. Robert Forbes: Recent Developments in Medical Litigation.

UNIVERSITY OF EDINBURGH, University New Buildings, Teviot Place, Edinburgh
5 P.M. Dr. A. G. Macgregor: Radioactive Iodine in Medicine. (Honyman Gillespie lecture.)

UNIVERSITY OF ST. ANDREWS, Medical School, Small's Wynd, Dundee
5 P.M. Prof. B. L. McFarland: Congenital Dislocation of the Hip.

Friday, 12th

POSTGRADUATE MEDICAL SCHOOL OF LONDON
2 P.M. Mr. Guy Blackburn: Pancreatitis.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. Brian Russell: Neurodermatitis.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
3.30 P.M. Mr. G. H. Howells: Malignant Disease of the Nose and Nasal Sinuses.

INSTITUTE OF NEUROLOGY
5 P.M. Dr. Noel Peron (Paris): Familial Ulcerous and Mutilating Acropathies.

BIOCHEMICAL SOCIETY
2 P.M. (St. Bartholomew's Medical College, Charterhouse Square, E.C.1.) Scientific papers.

OSLER CLUB
7.45 P.M. (11, Chandos Street, W.1.) Dr. J. R. Nicholls, Dr. A. E. Clark-Kennedy, Dr. D. V. Hubble, Sir Harry Greenfield: *Opium.*

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW, 242, Vincent Street, Glasgow
5 P.M. Dr. G. B. Shaw: Management of Hypertension.

Appointments

BOBASCH, EVA M., L.R.C.P.E.: asst. M.O., child-health service, West Ham.

FARQUHAR, J. V. L., M.A. Camb., M.R.C.S., D.P.H.: senior asst. M.O., Nottingham.

FARRELL, MARGARET R., L.R.C.P.E., D.P.H.: asst. M.O., Coatbridge, Lanarkshire.

GHOSE, RASHBEHARI, M.B. Calcutta, F.F.A.R.C.S., D.A.: whole-time asst. anæsthetist, Moorgate General Hospital, Rotherham.

HILTON, A. L., M.B. Camb.: whole-time asst. venereologist at centres in Doncaster, Rotherham, and Sheffield.

HULSE, N. L., M.B. Aberd.: appointed factory doctor, Brackley, Northampton.

JAMES, C. C. M., M.A. Camb., PH.D. Edin., F.R.C.S.: hon. consultant orthopædic surgeon, Northumberland education committee.

LAW, J. S., M.D. St. And.: physician-superintendent, Holywood Hall Sanatorium, Newcastle upon Tyne.

MOOLAN-FEROZE, R. J., M.D. Lond., F.R.C.S., M.R.C.O.G.: surgeon, Chelsea Hospital for Women, London.

MUGGOCH, J. W., L.R.C.P.E., D.A.: hon. anæsthetist, Italian Hospital, London.

SAXTON, H. M., M.B. Lond.: medical registrar, St. Martin's Hospital, and the Royal National Hospital for Rheumatic Diseases, Bath.

SPRIGGS, E. A., D.M. Oxfd, M.R.C.P.: physician-superintendent, Barrasford Sanatorium, Newcastle upon Tyne.

North East Metropolitan Regional Hospital Board:

MUIR, A. H. R., M.R.C.S., D.M.R.D.: full-time consultant radiologist, Southend-on-Sea group of hospitals.

PARSONS, H. M., M.R.C.S., D.L.O.: part-time consultant E.N.T. surgeon, Waltham Abbey War Memorial Hospital.

POTASCHMACHER, L. O., M.D. Montpellier: full-time consultant pathologist, Tilbury and South East Essex group of hospitals.

SHELSWELL, J. H., M.B. Manc., F.R.C.S.: part-time consultant orthopædic surgeon, Southend-on-Sea group and Runwell Hospital.

STONHAM, J. G., M.D. Melb., F.R.C.S., D.L.O.: part-time consultant E.N.T. surgeon, Rush Green Hospital.

Birmingham Regional Hospital Board:

MOFFAT, J. R., M.B. Camb., F.R.C.S.E.: part-time consultant surgeon, Coventry group (duties mainly at Manor and George Eliot hospitals, Nuneaton).

MOORE, R. J. F., L.M.S.S.A.: whole-time asst. anæsthetist, (S.H.M.O.), Burton-on-Trent group.

MUCKLOW, E. H., M.B. Birm., F.F.R.: whole-time consultant radiologist, Birmingham (Dudley Road) group.

YOUNG, H. B., M.B. Glasg., F.R.C.S.E., F.R.F.P.S., D.P.H.: part-time consultant surgeon, Wolverhampton group (duties mainly at Bridgnorth Infirmary).

Liverpool Regional Hospital Board:

ANSELL, GEORGE, M.D. Lpool, M.R.C.P., D.M.R.D.: whole-time asst. radiologist, East Liverpool area.

BURROWS, M. McC., M.B. Belf., F.F.A.R.C.S., D.A.: whole-time asst. anæsthetist, duties mainly at Walton Hospital.

COOK, E. H. L., M.B. Lpool, F.R.C.S., D.O.M.S.: part-time consultant ophthalmologist, Bootle Hospital.

Births, Marriages, and Deaths

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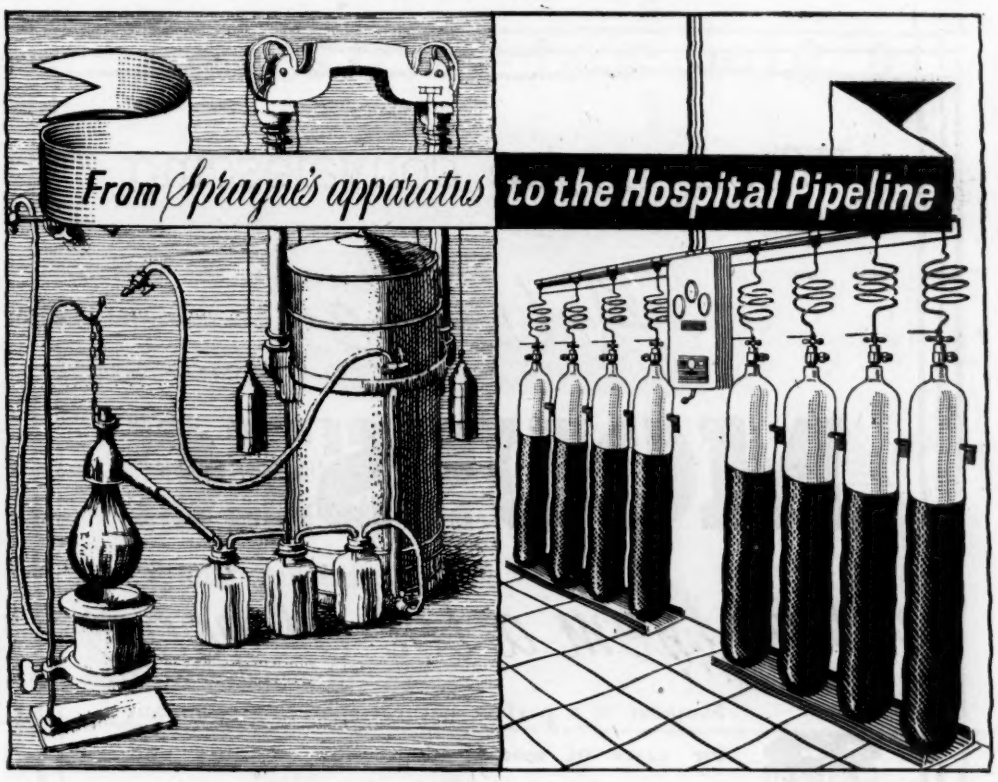

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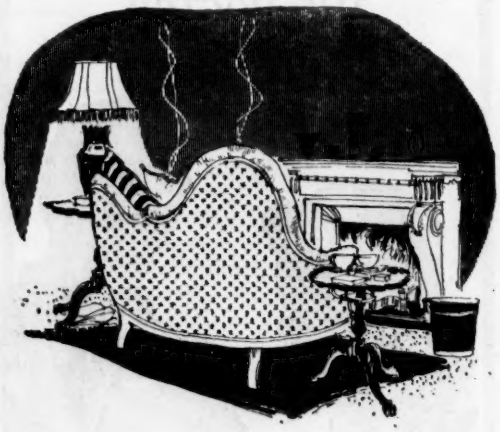

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The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

ROYAL COLLEGE OF PHYSICIANS

LEVERHULME RESEARCH SCHOLAR

Applications are invited for a Leverhulme Research Scholarship value of £1000 a year. The Scholarship will be for 1 year in the first instance and may be renewed for a maximum of 3 years. A scholar must satisfy the College that the major part of his time is spent on his research but he may be allowed to hold another appointment. Scholars must devote themselves to the investigation of some problem related to disease as it occurs in man, in any branch of medicine. The work must be done in some established institution, preferably in the United Kingdom, in which full facilities for the research are available.

Applications, accompanied by the names of 2 referees, should state details of the proposed work, the name of the individual under whom it is proposed to work, and the Institution where the work is to be done. Application forms may be obtained from the Assistant Registrar, Royal College of Physicians, Pall Mall East, London, S.W.1. Applications for the Scholarship must be received not later than 10th January, 1955.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

The following LECTURES will be delivered in the Hall of the Royal Faculty of Physicians and Surgeons, 242, St. Vincent-street, Glasgow. Medical practitioners are invited to attend.

WEDNESDAY, 10TH NOVEMBER, 1954, at 5 P.M.
"Prognosis in Bright's Disease," by Prof. CLIFFORD WILSON, M.A., D.M., F.R.C.P.

WEDNESDAY, 19TH JANUARY, 1955, at 5 P.M.
"Physiological Principles in the Care of the Unconscious Patient," by Prof. WILLIAM W. MUSHIN, F.F.A., R.C.S. ENG.

WEDNESDAY, 9TH FEBRUARY, 1955, at 5 P.M.
"The Rôle of Serum Proteins in the Vascular Phenomena of Inflammation," by Prof. A. A. MILES, C.B.E., M.D., F.R.C.P.

WEDNESDAY, 16TH MARCH, 1955, at 5 P.M.
"Breast Cancer," by Prof. ROBERT MCWHIRTER, F.R.C.S.ED.

242, St. Vincent-street, Glasgow, C.2.

UNIVERSITY OF LONDON

A LECTURE entitled "On the Excretion of 17-ketosteroids in Human Urine," will be given by Dr. C. HAMBURGER (State Serum Institute, Copenhagen) at 5.15 P.M., on 15TH NOVEMBER at Guy's Hospital Medical School, St. Thomas's-street, S.E.1.

Admission free, without ticket.

JAMES HENDERSON, Academic Registrar.

SYDNEY WATSON SMITH LECTURE

A Sydney Watson Smith Lecture will be delivered by Dr. ADAM PATRICK, F.R.C.P., within the Hall of the Royal College of Physicians, 9, Queen-street, Edinburgh, on WEDNESDAY, 10TH NOVEMBER, 1954, at 5 P.M.

Subject: "The Enteric Fevers 1800–1920."

THE ROYAL SOCIETY

UNITED STATES (F.O.A.) RESEARCH FELLOWSHIPS

Applications are invited for United States (F.O.A.) Research Fellowships, tenable from SUMMER, 1955, to 30TH JUNE, 1957, in American research institutions. The period of tenure may be less than 2 years but not less than 1 year and other things being equal preference will be given to candidates who can go for 2 years. The Fellowships are open for award to British Scientists normally resident in the United Kingdom who propose to do *research in the natural sciences and in the engineering, agricultural* and medical sciences, but excluding clinical medicine. Successful candidates, who will mostly be between 26 and 32 years of age and who will be required to undertake to return *to resume scientific work in the United Kingdom on completion* of tenure of Fellowships, will be placed in American universities to participate with American colleagues in current fundamental scientific research as closely as possible related to their own fields of interest. Candidates must possess a doctoral degree in science or have equivalent experience. The Fellowships provide travel pay at the rate of $9 a day in the United States and *certain other allowances.*

Application should be made before 7th December, 1954, to the Assistant Secretary, The Royal Society, Burlington House, London, W.1, from whom fuller particulars and forms of application may be obtained. Results of applications may not be announced until May, 1955.

UNIVERSITY OF LONDON KING'S COLLEGE invites *applications from graduates with medical qualifications for the* post of LECTURER IN ANATOMY. The appointment will date from 1st January, 1955. It will be on the Junior Lecturer scale of £600–£50–£750, with family allowances and F.S.S.U. benefits.

Particulars and application forms should be obtained from the Registrar, King's College, Strand, W.C.2, whom completed *applications* should reach by 22nd November.

INSTITUTE OF OPHTHALMOLOGY. (University of LONDON.) Applications are invited for the post of Full-time ASSISTANT PATHOLOGIST. The essential duties are those *of general routine clinical pathology but the post offers* exceptional opportunities for research. Previous experience in ocular pathology is not necessary. According to age and experience the post will be either in the grade of Senior Lecturer, salary scale commencing at £1250, rising by annual increments of £100 to £1750 p.a., or of Junior Lecturer, salary scale commencing at £900, rising by annual increments of £100 to £1100 p.a. The *post requires membership of the appropriate superannuation* scheme. Family allowances are admissible.

Applications, together with copies of 3 recent testimonials, should reach the undersigned not later than 15th November, 1954.

C. F. SEATH, Secretary.

Institute of Ophthalmology, Judd-street, W.C.1.

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY

An INTENSIVE COURSE *suitable for* postgraduates preparing for Higher Examinations (M.R.C.O.G. and M.D.) is being held from 29TH NOVEMBER to 11TH DECEMBER, 1954, at Queen Charlotte's Maternity Hospital, The Chelsea Hospital for Women and the Department of Obstetrics and Gynæcology at Hammersmith Hospital.

The fee for the course is 14 guineas.

A limited amount of hostel accommodation is available.

Applications should be sent to the Secretary of the Institute of Obstetrics and Gynæcology, Chelsea Hospital for Women, Dovehouse-street, London, S.W.3.

GUY'S HOSPITAL MEDICAL SCHOOL. Applications are invited for a Full-time RESEARCH FELLOWSHIP in the Thoracic Surgical Unit for research on Cardiovascular problems. It is desirable that applicants should possess a higher qualification in surgery. Salary within the range £850–£1100 p.a., according to the experience of the person appointed.

Applications, with the names of 3 referees, should be sent to the Dean, Guy's Hospital Medical School, London Bridge, S.E.1.

Hospital Services: Senior Appointments

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

Part-time CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST, The Prince of Wales's General Hospital, N.15 (2 sessions a week), Bearsted Memorial Hospital, N.16 (1 session a week). Joint appointment.

Applications (6 copies), and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 20th November, 1954.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) ADMISSIONS OFFICER (whole-time), Central Middlesex Hospital, N.W.10 (726 Beds). Some experience in general practice desirable. Appointment for 4 years in first instance. Commencing salary according to qualifications and experience, on the scale £1500 (unless below age 32)–£1950.

Applications by 15th December, 1954.

(2) CONSULTANT PHYSICIAN (part-time) for 7 half-days a week at Barnet General Hospital, Wellhouse-lane, Barnet (478 Beds). Successful candidate required to live within easy reach of the Hospital.

Applications by 7th December, 1954.

Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of Part-time THORACIC SURGEON. *This is a Consultant appointment. Candidates must be Fellows* of the Royal College of Surgeons (England). The appointment will be for 3 notional half-days per week, and remuneration and conditions of service will be those applicable to part-time *Consultant staff under the National Health Service.*

Applications, stating age, qualifications, and experience, together with the names of 3 referees, should be sent to the undersigned *not later than 18th December, 1954.*

P. H. CONSTABLE, House Governor.

LEEDS. THE UNITED LEEDS HOSPITALS AND THE LEEDS REGIONAL HOSPITAL BOARD. *A joint appointment of* NEUROSURGEON of Consultant status is required for duties in hospitals under the control of the Leeds Regional Hospital Board, and as Assistant Surgeon in the Department of Neuro-*surgery at the United Leeds Hospitals. Jointly the appointment* will be part-time (with maximum sessions).

Applications, stating age, nationality, qualifications, full details of experience (with all relevant dates), and the names of 3 *referees, should be sent to the undersigned by 24th November,* 1954.

J. ARNOLD TUNSTALL,
Secretary to the Board of Governors, United Leeds Hospitals, *and Secretary to the Advisory Appointments Committee.*
The General Infirmary at Leeds, Leeds, 1.

LIVERPOOL REGIONAL HOSPITAL BOARD. Barrow-MORE HOSPITAL. Applications are invited for the post of Whole-*time SENIOR RESIDENT MEDICAL OFFICER with duties* at the above Hospital. Barrowmore is a sanatorium situated within 7 miles of Chester and has 173 beds, including 26 beds *reserved for major thoracic surgical cases. Candidates should* have had special experience in tuberculosis. Single male residential accommodation is available for which an appropriate deduction will be made. Salary £1500 (at age 32)–£50–£1950 p.a.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 27th November, 1954.

VINCENT COLLINGE, Secretary to the Board.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) Whole-time resident post of ASSISTANT PHYSICIAN *(infectious diseases), Senior Hospital Medical Officer, at Lady-*well Hospital, Salford, with some duties at Astley Hospital, near Wigan. Good experience in general medicine, and particularly in diagnosis and treatment of infectious diseases, essential. *It may be necessary for the successful candidate to hold the post* in a non-resident capacity in the first instance. 15th November, 1954.

(*b*) Whole-time NON-RESIDENT ASSISTANT *RADIO-*LOGIST (Senior Hospital Medical Officer) to the Lancaster and Kendal Hospitals (Royal Lancaster Infirmary, Queen Victoria Hospital, Morecambe, and Westmorland County Hospital, *Kendal, &c.) and neighbouring mental hospitals. Candidates* should possess the D.M.R.D. and have wide experience of diagnostic radiology. 22nd November, 1954.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by dates stated.

EXETER CLINICAL AREA. South-Western Regional HOSPITAL BOARD. Applications are invited from registered medical practitioners for the appointment of CONSULTANT PSYCHIATRIST in the Exeter Clinical Area. Applicants should have had wide experience in psychiatry and must possess the Diploma in Psychological Medicine. For a period of 5 years the appointment will be held on a whole-time basis : thereafter the terms of the appointment in this respect will be the subject of review. The successful candidate will have charge of beds in a mental hospital in association with the Medical Superintendent of Digby and Wonford Hospitals, Exeter, together with out-patient facilities at general hospitals. The work will be largely clinical in nature but the successful candidate may be required to assist the Medical Superintendent with administrative matters from time to time. He will also be required to undertake domiciliary visits. An unfurnished house will be available at Wonford Hospital, Exeter.

Applications (12 copies), stating date of birth, qualifications, and experience, together with 12 copies of 2 testimonials, and the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 20th November, 1954.

HASTINGS GROUP HOSPITAL MANAGEMENT COM-MITTEE. Locum Whole-time ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer) required, pending permanent appointment, for the Hastings Group of hospitals. Post vacant mid-December. National scale of remuneration, viz. £1400–£1950 p.a.

Apply, stating age, nationality, qualifications and experience, to Group Secretary, 11, Holmesdale-gardens, Hastings.

NEWCASTLE REGIONAL HOSPITAL BOARD.

Tees-side Hospital Management Committee (population 350,000). Stockton and Thornaby Hospital (130 Beds)

SENIOR CASUALTY OFFICER (whole-time). Duration of tenure of post not exceeding 4 years. The Senior Casualty Officer will be required, subject to the supervision of the Senior Surgeon to General Surgical Clinic No. 3 and the Senior Orthopædic Surgeon, to organise the work of the busy Casualty Department. The Senior Casualty Officer must reside near the Stockton and Thornaby Hospital. Further particulars may be obtained from the Senior Surgeon, General Surgical Clinic No. 3 at the Stockton and Thornaby Hospital, Stockton-on-Tees.

Wansbeck Hospital Management Committee (population 146,614). (Main hospital : Ashington, 55 Beds, 45 surgical.)

SENIOR CASUALTY OFFICER (whole-time). Duration of tenure of post not exceeding 4 years. The Senior Casualty Officer will be required, subject to the supervision of the Senior General Surgeon, to organise and handle the casualty work throughout the group, the main centre being at Ashington Hospital. This Hospital serves an industrial area and deals with a large number of accidents. A new 3-bedroomed detached house, within the curtilage of the Hospital, is being built and will be available on a rental basis either furnished or unfurnished, as desired.

Salary £1500–£50–£1950 or £1400–£50–£1950, according to age.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Senior Administrative Medical Officer, " Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 28 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Special AREA FOR CUMBERLAND AND NORTH WESTMORLAND. ASSISTANT ORTHOPÆDIC SURGEON (Senior Hospital Medical Officer grade) required for East Cumberland Group of hospitals. The main Orthopædic, Fracture and Rehabilitation Departments are situated at the Cumberland Infirmary, Carlisle (340 Beds), and the Surgeon appointed must reside near this Hospital.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Senior Administrative Medical Officer, 1, Lonsdale-street, Carlisle, within 28 days. Further particulars may be obtained from the Senior Orthopædic Surgeon, Cumberland Infirmary, Carlisle.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of FIRST ASSISTANT SURGEON (Consultant grading) at the Royal Hospital for Sick Children, Glasgow. The appointment will be whole-time or part-time, remunerated on the basis of 8 notional half-days per week. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, not later than 30 days after the publication of this advertisement.

SCOTLAND. SOUTH-EASTERN REGIONAL HOS-PITAL BOARD. Applications are invited from registered medical practitioners for the appointment of DEPUTY SENIOR ADMINISTRATIVE MEDICAL OFFICER to the above Board. The salary is on the scale £1600–£100–£2100, and the post is superannuable.

Applications, giving particulars of qualifications and experience, together with the names of 3 referees, should be sent to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, by Monday, 6th December, 1954.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. ROYAL INFIRMARY UNIT. Applications are invited for the whole-time post of CONSULTANT NEUROPATHOLOGIST at the above Hospital.

Applications (16 copies), stating age, qualifications and experience, with the names of 3 referees, should be sent not later than 30th November, 1954 to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1, from whom further details may be obtained.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT RADIOTHERAPIST to the Radiotherapy Centre at Derbyshire Royal Infirmary. The successful candidate will work under the direction of the Consultant Radiotherapist-in-charge. Candidates should have a good clinical background and be in possession of the D.M.R.T. Salary scale £1500–£50–£1950.

Application forms and further details obtainable from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 4th December, 1954.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners with previous experience in mental deficiency for the appointment of Whole-time MEDICAL OFFICER in the Senior Hospital Medical Officer grade to the Hortham-Brentry Hospital Group (Mental Deficiency), Bristol (1359 Beds). The successful candidate will be mainly concerned with the clinical work and administration of Brentry Hospital which contains approximately 420 beds. He will work under the general direction of the Medical Superintendent and will also be required to visit some of the ancillaries. Accommodation, suitable for a married man, is available at the Hospital.

Applications (12 copies), stating date of birth, qualifications, and experience, together with 12 copies of 2 testimonials, and the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 20th November, 1954.

WELSH REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT CHEST PHYSICIAN (Senior Hospital Medical Officer) mid-Wales Group with duties at Tregaron and Machynlleth Chest Hospitals, based at Aberystwyth. Successful candidate will work under direction of Consultant Chest Physician.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff.

EAST PAKISTAN. DACCA MEDICAL COLLEGE HOSPITAL. Applications are invited for the post of SURGEON at the above Hospital for a 2-year appointment. Duties will include teaching and reorganising the Department of Surgery at the Hospital. This vacancy is to be filled by the United Kingdom Government as a contribution to the Pakistan Government under the Technical Co-operation Scheme of the Colombo plan. Upper age limit 50 years. Salary £2100–£2750 p.a. according to experience, plus tax-free overseas allowance £2350 (married) or £1575 (single) p.a. Suitable accommodation available and rent allowance paid. Special clothing allowance. Free medical attention. Travel allowance for journeys on duty. First-class return passage for selected candidate and family.

Write, giving full particulars of experience and qualifications, and the names of 3 referees, to the Secretary, Ministry of Health, Division 5A, Savile-row, London, W.1. Closing date for applications 15th November, 1954.

AUSTRALIA. THE BROKEN HILL AND DISTRICT HOSPITAL. P.O. Box 457, BROKEN HILL, NEW SOUTH WALES, AUSTRALIA. Applications are invited from qualified persons for the position of RESIDENT PHYSICIAN, preferably with a Degree of a Royal College of Physicians, to the above Hospital, situated in a large industrial field, and which is a self-contained unit of 320 beds. Daily average of inpatients 289, outpatients attendances approximately 100,000 annually. Salary £2000 p.a., 30 days annual leave, and other exceptional conditions. The successful applicant will be the Chief Resident Medical Officer, acting in the capacity of a Medical Superintendent. The training of Junior Resident Medical Officers will also be his responsibility. In addition to the above salary, full board and lodgings is available in the case of single applicants, and a rent free residence is available for married applicants, plus other concessions.

Air-mail applications closing with the undersigned on 30th November, are to state age, marital status, particulars of experience, qualifications and enclose copy of credentials only.

R. H. NANKIVELL, Secretary and Business Manager.

WESTERN AUSTRALIA. ROYAL PERTH HOSPITAL. The Board of Management invites applications for the position of Whole-time ASSISTANT RADIOLOGIST. Applicants must hold a Diploma in Medical Radiology (Diagnostic). Salary range £1870–£1920–£1970–£2020 (Aust.) p.a., with periodical cost-of-living adjustment. Commencing salary rate is dependent upon qualifications and experience.

Applications, detailing age, marital status, qualifications, experience, war service, &c., must reach the undersigned by 31st December, 1954. A memorandum of further particulars concerning this position will be supplied on request.

JOSEPH GRIFFITH, Administrator.

NEW ZEALAND. PALMERSTON NORTH HOSPITAL. Applications are invited for the position of PHYSICIAN at the above Hospital (a general hospital of some 400 Beds). The position is whole-time and includes charge of general medical and chest beds and the duties of Assistant Medical Superintendent. Salary and conditions of appointment are covered by the New Zealand Hospital Employment Regulations 1952 and Amendments. Conditions of appointment and full particulars are obtainable on application to the New Zealand High Commissioner, 415, Strand, London, W.C.2, or by air mail.

Applicants must give details of nationality, age, sex, qualifications and experience and include 3 testimonials from medical referees. Applications close on 6th December, 1954, and should be addressed to the Medical Superintendent.

Hospital Services : Junior Appointments

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.11. HOUSE SURGEON (resident), vacant 1st December. Open to registered practitioners and pre-registration candidates.

Apply Hospital Secretary, enclosing copies of 3 recent testimonials, by 17th November, 1954.

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.11. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (medical), whole-time, non-resident, for 1 year in the first instance from 1st February, 1955.

Forms of application from the Secretary, Battersea and Putney Group Hospital Management Committee, 54, Upper Richmond-road, S.W.15, to whom they should be returned within 14 days.

BATTERSEA GENERAL HOSPITAL, S.W.11. House SURGEON/CASUALTY OFFICER (resident or non-resident), vacant mid-December. House Officer grade, not pre-registration.

Apply Hospital Secretary, enclosing copies of 2 recent testimonials.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required in the E.N.T. Department. Whole-time, non-resident appointment for 1 year in first instance; under supervision of visiting Consultant. Previous operative experience desirable. Appointment is approved for F.R.C.S. (Eng.). Candidates are welcome to visit the Hospital by direct appointment with the Medical Director.

Application forms obtainable from, and returnable to, Group Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 20th November, 1954.

CHILDREN'S HOSPITAL, Sydenham, S.E.26. (100 Beds.) SENIOR RESIDENT MEDICAL OFFICER (Senior House Officer grade) required 1st December for 1 year. Duties include medicine and surgery. Recognised for D.C.H. Previous pædiatric experience essential.

Apply, naming 2 referees, to Administrative Officer by 12th November.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of FIRST HOUSE PHYSICIAN for Medicine and Pædiatrics, to become vacant 1st January, 1955. Appointment for 6 months. Salary in accordance with Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 10th November, 1954.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of SECOND HOUSE SURGEON. Appointment for 6 months from 1st January, 1955. Salary according to Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 10th November, 1954.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of OBSTETRIC HOUSE SURGEON (recognised for the M.R.C.O.G.). Duties to commence 1st January, 1955. Appointment for 6 months. Salary in accordance with Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, to be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 10th November, 1954.

HACKNEY HOSPITAL, London, E.9. (844 Beds.) House PHYSICIAN (not pre-registration) required for 6 months from 1st December.

Apply, with copy testimonials, to Group Secretary, at above address, by 17th November, quoting H/HP.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, London, N.21. HOUSE PHYSICIAN, vacant 25th November, 1954. Preference given to applicants seeking pre-registration post under Medical Act, 1950.

Applications, with copies of 3 testimonials, to Hospital Secretary.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from registered medical practitioners (Male) for the appointment of HOUSE SURGEON, to become vacant forthwith. Appointment will be for a period of 6 months. Salary is at the rate of £350–£400 p.a., according to posts previously held.

Applications to the Secretary, together with copies of 3 recent testimonials.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. Applications are invited for the appointment of RESIDENT MEDICAL OFFICER. Appointment for 1 year from 1st January, 1955, and graded as Registrar.

Applications, stating age, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should be sent to the undersigned not later than 13th November, 1954. THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for 2 Part-time SENIOR REGISTRARS to the Ophthalmic Department becoming vacant on 1st January, 1955. Candidates must be Fellows of the Royal College of Surgeons. The successful candidates will be required to attend on 3 half-days per week each.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the House Governor by 22nd November, 1954. H. BRIERLEY, House Governor.

MARLBOROUGH DAY HOSPITAL, 38, Marlborough-place, St. John's Wood, N.W.8. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. PSYCHIATRIC REGISTRAR for 3 sessions per week to commence as soon as possible. Clinic may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 17th November, 1954.

MILE END HOSPITAL, Bancroft-road, E.1. (Obstetric beds 60; Gynæcological beds 31.) Applications are invited for the post of SENIOR HOUSE OFFICER (obstetrics and gynæcology). Post recognised for M.R.C.O.G.

Application forms obtainable from the Physician-Superintendent to be returned by 11th November with copies of not more than 3 testimonials.

NORTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD.

(1) REGISTRAR in Obstetrics and Gynæcology (resident), North Middlesex Hospital, Edmonton, N.18. Recognised for M.R.C.O.G.

(2) REGISTRAR in Obstetrics (resident), The Mothers' (Salvation Army) Hospital, Clapton, E.5. Recognised for M.R.C.O.G.

(3) REGISTRAR in Obstetrics and Gynæcology (resident or non-resident), Essex County and Colchester Maternity Hospitals, Colchester, Essex.

(4) SURGICAL REGISTRAR (resident), Essex County Hospital, Colchester, Essex. Recognised for F.R.C.S.

(5) SURGICAL REGISTRAR (resident or non-resident), Bethnal Green Hospital, E.2. Recognised for F.R.C.S. (If non-resident will be required to "sleep-in" on duty nights.)

(6) E.N.T. REGISTRAR (non-resident), Whipps Cross Hospital, E.11. Some duties at Park House Health Centre E.N.T. Clinic.

(7) ORTHOPÆDIC REGISTRAR (resident), Tilbury and Riverside General Hospital, Tilbury.

(8) ORTHOPÆDIC REGISTRAR (resident or non-resident), Southend General Hospital, Southend, Essex. Post vacant 1st January, 1955.

(9) PÆDIATRIC REGISTRAR (non-resident), Southend Group of Hospitals, Southend, Essex. M.R.C.P. and/or D.C.H. preferred. Previous experience essential.

(10) MEDICAL REGISTRAR (resident or non-resident), St. George-in-the-East Hospital, Wapping, E.1.

Appointments subject to review after 1 year.

Separate applications in duplicate, with 2 copies of 2 recent testimonials, to Secretary, 11A, Portland-place, W.1, by 20th November, 1954.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. CASUALTY OFFICER (Senior House Officer grade). Post recognised for F.R.C.S. 6 months appointment starting 20th December. Non-resident.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials and/or names of 2 referees, to Secretary of Hospital, by 16th November.

PADDINGTON GREEN CHILDREN'S HOSPITAL, W.2. (ST. MARY'S HOSPITAL.) Applications are invited for the post of HOUSE SURGEON (first post). Pre-registration post, vacant 1st December, 1954. Tenable for 6 months.

Applications, stating age, nationality, qualifications with dates, and experience, with copies of 3 recent testimonials, should reach the Secretary not later than 13th November, 1954.

PADDINGTON GREEN CHILDREN'S HOSPITAL, W.2. (ST. MARY'S HOSPITAL.) Applications are invited for the post of HOUSE PHYSICIAN (second post). Pre-registration post, vacant 1st December, 1954. Tenable for 6 months.

Applications, stating age, nationality, qualifications with dates, and experience, with copies of 3 recent testimonials, should reach the Secretary not later than 13th November, 1954.

POPLAR HOSPITAL, East India Dock-road, E.14. (120 Beds.) Required, HOUSE SURGEON (pre-registration post). Duties include inpatient, outpatient and casualty work. Recognised for F.R.C.S. Vacant 1st December.

Applications, stating age, nationality and qualifications, to the Secretary.

ROYAL FREE HOSPITAL GROUP. Applications are invited for the post of SENIOR GYNÆCOLOGICAL REGISTRAR to the Gynæcological and Obstetric Department. The post is full time and recognised under the Senior Registrar establishment. Duties to commence 1st February, 1955. Candidates should be Members of the Royal College of Obstetricians and Gynæcologists.

Applications, together with the names of 3 referees, should be sent to the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 19th November, 1954.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, London, W.1. Applications are invited for the appointment of SENIOR ORTHOPÆDIC REGISTRAR (full-time non-resident). Applicants must be Fellows of 1 of the Royal Colleges of Surgeons. During the tenure of office 1 year may be spent at the Luton and Dunstable Hospital.

Applications to be received not later than 22nd November, 1954. Forms of application can be obtained from the House Governor at 234, Great Portland-street, London, W.1.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for an appointment as a Whole-time REGISTRAR in Obstetrics and Gynæcology to fill a vacancy in the approved trainee establishment at the Lewisham Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 20th November, 1954.

SOUTH LONDON HOSPITAL FOR WOMEN, Clapham Common, S.W.4. Applications are invited from pre-registration and registered Female medical practitioners for the appointment of OBSTETRIC HOUSE SURGEON at the above Hospital. Post recognised for the M.R.C.O.G. Appointment is for 6 months from 11th January, 1955.

Forms of application from the Secretary.

SOUTH WESTERN HOSPITAL, Landor-road, S.W.9. HOUSE PHYSICIAN required at the above Hospital. Combined T.B. and acute medicine. Post vacant in December.

For form of application apply to the Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11.

ST. ALFEGE'S HOSPITAL, S.E.10. Resident or non-resident Locum JUNIOR HOSPITAL MEDICAL OFFICER (geriatrics), required 15th–21st November, 1954 (inclusive). Whitley Council rate.

Telephone : GREenwich 2655. Ext. 117.

ST. FRANCIS' HOSPITAL, Constance-road, East Dulwich, S.E.22. (398 geriatric and long-stay chronic sick.) Applications invited for appointment as SENIOR HOUSE OFFICER (medical duties). Unit under direction of full-time Geriatrician " association with ' half-way ' home " facilities for investigations. Salary £745 p.a., with deduction at rate of £150 p.a. for residential services. Post vacant early in December.

Applications, stating age, qualifications, and experience, including copy testimonials, to the Group Secretary, Camberwell Hospital Management Committee, Dulwich Hospital, S.E.22.

ST. GEORGE'S HOSPITAL, S.W.1, and ROYAL HAMPSHIRE COUNTY HOSPITAL, WINCHESTER. (Joint appointment.) Applications are invited for the post of SURGICAL FIRST ASSISTANT, in the grade of Senior Registrar. Candidates should hold the Diploma of Fellow of the Royal College of Surgeons (England). The appointment will be for 1 year in the first instance, with effect from 1st January, 1955. The successful candidate may be required to serve part of the normal period as Senior Registrar at St. George's Hospital, S.W.1, and part at the Royal Hampshire County Hospital, Winchester.

Applications, stating age, education, qualifications and experience, together with the names of 2 referees, should reach the undersigned not later than 20th November, 1954.

P. H. CONSTABLE, House Governor.

St. George's Hospital, S.W.1.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of HOUSE SURGEON (resident) in the grade of Senior House Officer to the Department of Neurosurgery at the Atkinson Morley's Hospital, Wimbledon. The successful candidate will be required to take up duty on 1st January, 1955.

Applications, giving details of age, education, qualifications, experience, and the names of 2 referees, should be received by the undersigned not later than 19th November, 1954.

P. H. CONSTABLE, House Governor.

ST. MARY'S HOSPITAL, Paddington, W.2. Applications are invited for the post of Part-time REGISTRAR to the E.N.T. Department for 5 notional half-days per week (3 of these notional half-days to be undertaken at the Princess Louise (Kensington) Hospital for Children). The successful candidate will be required to take up his duties as soon as possible.

Applications, stating nationality, date of birth, permanent address, qualifications, with dates and details of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 24th November, 1954.

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of Whole-time SENIOR REGISTRAR in Bacteriology to St. Mary's Hospital Group. The successful candidate will be required to devote 8 notional half-days per week to St. Mary's Hospital and the remaining 3 notional half-days to the Samaritan and Western Ophthalmic Hospitals. The appointment is for a period of 12 months from 1st January, 1955, and the holder will be eligible for re-election.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, and details of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, by 16th November, 1954.

ST. STEPHEN'S HOSPITAL, Fulham-road, Chelsea, S.W.10. PÆDIATRIC HOUSE PHYSICIAN (resident), vacancy late November.

Applications, naming 2 referees, to Medical Superintendent.

ST. STEPHEN'S HOSPITAL, Fulham-road, Chelsea, S.W.10. HOUSE PHYSICIAN (pre-registration), resident.

Apply, naming 2 referees, to the Medical Superintendent.

TOTTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE, The Green, N.15. RESIDENT OBSTETRIC HOUSE OFFICERS (third post) required at Bearsted Memorial Hospital (Jewish Maternity Hospital), Lordship-road, N.16, and The Green, Hampton Court, for 6-month posts commencing 1st January, 1955. Previous obstetric experience an advantage. Recognised for the D.Obst.R.C.O.G.

Application forms from the Group Secretary, which should be returned at once.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of REGISTRAR to Psychiatric Department starting 12th January for 1 year in the first instance.

Applications (6 copies), giving names of 2 referees, to House Governor by 19th November, 1954.

WILLESDEN GENERAL HOSPITAL, Harlesden-road, N.W.10. RESIDENT HOUSE SURGEON required for 6 months from 14th December, 1954, plus 2 weeks locum from 1st December, 1954. Pre-registration candidates eligible.

Applications, with full details, and names of 2 referees, to Hospital Secretary, by 16th November, 1954.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. ABERDEEN ROYAL INFIRMARY. Applications are invited for the appointment of REGISTRAR in Orthopædics at the above Hospital. The post is a whole-time one and is non-resident. Salary and conditions of service in accordance with the terms issued by the Department of Health for Scotland.

Applications, giving details of qualifications and experience, with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

ALTON, HAMPSHIRE. LORD MAYOR TRELOAR ORTHOPÆDIC HOSPITAL. LOCUM for Orthopædic Registrar required immediately at the above Hospital for 3 months. Good surgical experience required. Post provides experience in non-pulmonary tuberculosis and general orthopædics and includes attendances at peripheral clinics. Salary £16 per week, less emoluments.

Apply at once, with names of 2 referees, to the Secretary, Lord Mayor Treloar Orthopædic Hospital, Alton, Hants.

ALTON, HAMPSHIRE. LORD MAYOR TRELOAR ORTHOPÆDIC HOSPITAL. Applications are invited from registered medical practitioners for the post of Whole-time ORTHOPÆDIC REGISTRAR. Post provides experience in non-pulmonary tuberculosis and general orthopædics and includes attendances at peripheral clinics. Accommodation available. Canvassing disqualifies, but visit to Hospital welcomed.

Write to Secretary for application form.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, NON-RESIDENT SENIOR HOUSE OFFICER for Pathological Laboratory. Previous clinical experience essential but pathological experience not essential. Post vacant January, 1955.

Applications, stating age, qualifications and previous experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

AYLESBURY, BUCKINGHAMSHIRE. STOKE MANDEVILLE HOSPITAL. RESIDENT HOUSE PHYSICIAN for the Department of Medicine, vacant 11th December. Recognised pre-registration post, applications from registered practitioners will be considered.

Apply, with copies of 2 testimonials, to Administrative Officer.

AYLESBURY, BUCKINGHAMSHIRE. ROYAL BUCKINGHAMSHIRE HOSPITAL. HOUSE SURGEON to the Department of Ophthalmology which is centred on this Hospital and which conducts work at peripheral clinics. Vacant now. Post is recognised for D.O. and duties will include some children's surgery.

Applications, with 2 testimonials, to Secretary-Superintendent as soon as possible.

AYLESBURY, BUCKINGHAMSHIRE. TINDAL GENERAL HOSPITAL. (260 Beds.) HOUSE PHYSICIAN (Chest Unit), Male or Female. Pre-registration post, but registered practitioners invited to apply. Vacant 3rd January, 1955. Duties include care of about 25 chest cases (including tuberculosis chalets) and 4 clinics weekly, including refills, forming a progressive chest unit for the Aylesbury area. Instruction in bronchoscopy and bronchography given. An acute Geriatric Unit (27 beds) and a medical outpatient clinic give general medical experience. No casualty department.

Please apply, with 2 testimonials, to the Administrative Officer as soon as possible.

BARNSTAPLE. NORTH DEVON INFIRMARY. (Central Group Hospital of 110 Beds.) Applications invited for appointment of SENIOR HOUSE OFFICER who will advise the House Physician and House Surgeon in their work and whose duties will include responsibility for work in Surgery, Casualty, Midwifery and Gynæcology, and E.N.T. Departments. Post vacant 1st January, 1955, for 1 year. Salary £745 p.a. Furnished flat available.

Applications, including names of 3 referees, to Group Secretary, 19, Alexandra-road, Barnstaple.

BATH. ROYAL UNITED HOSPITAL. Applications invited from registered or pre-registration medical practitioners for post of HOUSE PHYSICIAN at above Hospital. Post vacant end November or early December.

Applications stating age, qualifications and experience should be forwarded to Group Secretary, Bath Hospital Management Committee, Manor Hospital, Coombe Park, Bath, by 12th November.

BATH. ROYAL UNITED HOSPITAL. Applications are invited from registered and pre-registration medical practitioners for the post of HOUSE SURGEON at the above Hospital which becomes vacant at approximately the end of November.

Applications, stating age, qualifications, and experience, with 3 testimonials, should be forwarded to the undersigned by 13th November, 1954. J. LAWRENCE MEARS, Secretary,
Bath Hospital Management Committee.

Manor Hospital, Bath.

BATH. ST. MARTIN'S HOSPITAL. Applications are invited from registered and pre-registration medical practitioners for 2 posts of HOUSE SURGEON at above Hospital which will become vacant during December.

Applications, stating age, qualifications, and experience, with 3 testimonials, should be forwarded to the undersigned by 13th November, 1954. J. LAWRENCE MEARS, Secretary,
Bath Hospital Management Committee.

Manor Hospital, Bath.

BEDFORD GENERAL HOSPITAL. (437 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. GENERAL SURGICAL REGISTRAR (resident) required at above Hospital. Hospital may be visited by direct appointment. Post vacant immediately.

Application forms obtainable from, and returnable to, Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, as soon as possible.

BIRMINGHAM ACCIDENT HOSPITAL, Birmingham, 15. (215 Beds.) RESIDENT HOUSE SURGEONS (Male or Female). 3 posts vacant December, including 2 for Pre-registration Service. Posts are recognised by the Royal College of Surgeons for the casualty surgery training, now compulsory for the Fellowship examinations. Appointments will be for a period of 6 months in the General Accident Service and may (at the applicant's request) include a period in the 32-Bedded Burns Unit.

Applications to Administrator.

BIRMINGHAM. THE SKIN HOSPITAL, INPATIENTS' DEPARTMENT, George-road, BIRMINGHAM, 15. Required, SENIOR HOUSE OFFICER or HOUSE OFFICER according to experience. Inpatients Department is modern and well equipped, providing facilities for study of skin diseases. Successful applicant will be required to assist Consultant at outpatient clinics.

Applications, with copies of 2 recent testimonials, to Secretary, Dudley Road Hospital, Birmingham, 18.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER required for duties in the Geriatric Department (which contains acute admission wards and has full physiotherapy, laboratory and radiological facilities) and also to assist in the supervision of the health of nurses. Appointment will be for a period of 4 years in the first instance.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to Group Secretary, The Royal Infirmary, Bolton.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. MEDICAL RESEARCH ASSISTANT (Registrar status) required for the Cardiac Department, Poole General Hospital. Salary £850 or £965 p.a., in accordance with the prescribed conditions for the appointment of Registrars. The successful applicant will work with, and under the direction of, the Physician in charge of the Cardiac Department, and will be engaged entirely in research work.

Applications, stating age, nationality, qualifications, details of experience, and the names of 3 referees, should be sent within 14 days of the appearance of this advertisement, to the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. ROYAL VICTORIA HOSPITAL, WESTBOURNE, HANTS. Applications are invited for the immediate appointment of HOUSE SURGEON for E.N.T. and ophthalmic duties. In addition to duties at the above Hospital, the successful candidate will be required to assist in the E.N.T. outpatient clinics at the Royal Victoria Hospital, Bournemouth, and Poole General Hospital, Poole. The appointment is recognised for the D.O. and D.L.O. Diplomas but not for pre-registration purposes.

Applications to the Deputy Hospital Secretary, Royal Victoria Hospital, Shelley-road, Bournemouth.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road, BOSCOMBE. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE SURGEON for general and thoracic surgery. The post, which is now vacant, is recognised for the F.R.C.S. examination and for pre-registration purposes.

Applications to the Deputy Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. (492 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (resident), orthopædic and casualty combined. Post vacant 1st January, 1955, is recognised for the F.R.C.S. examination and is tenable for 12 months

Applications to the Deputy Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. (492 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Obstetrics and Gynæcology at the above Hospital. The post, which is resident, becomes vacant on 1st February, 1955, is subject to review after 1 year, and is recognised for the F.R.C.O.G. examination.

Forms of application, obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth, should be returned to him, duly completed, within 14 days of the appearance of this advertisement.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. (492 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. RESIDENT ANÆSTHETIST (Senior House Officer) required from 17th December. The post is recognised for the D.A. and F.F.A.R.C.S and is tenable for 12 months. Experience with Thoracic Unit available.

Applications to the Deputy Hospital Secretary at the Hospital.

BRADFORD. ST. LUKE'S HOSPITAL. Orthopædic HOUSE SURGEON/CASUALTY OFFICERS required. Salary £425–£525 p.a., less £125 p.a. residential emoluments. Recognised pre-registration appointments.

Applications, stating age, nationality, qualifications and experience with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (300 Beds.)

CASUALTY HOUSE SURGEON (1 of 3). Duties include work in Orthopædic and Traumatic Unit.

HOUSE SURGEON.

Both posts vacant 1st December and recognised for pre-registration and F.R.C.S.

Applications, stating age, qualifications, and experience, and naming 2 referees, to be sent to the Administrative Officer.

CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Gynæcology and Obstetrics. Appointment for 1 year (renewable), vacant. Gynæcology beds and clinics at Royal West Sussex and St. Richard's Hospitals; 16 obstetric beds St. Richard's; relief duties 50-bed unit, Rustington. Residence, St. Richard's. Experience both branches essential. Salary (Whitley) £850 first, £965 second year, less £150 p.a. residence. National Health Service superannuation.

Application forms, from Group Secretary, Royal West Sussex Hospital, Chichester, to be submitted within 14 days.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) RESIDENT HOUSE SURGEON required for 6 months appointment. National salary scale for first, second, or third posts. Post approved for pre-registration practitioners. Post recognised for F.R.C.S. 6 residents, including Resident Surgical Officer and 3 House Surgeons. Vacant from early December.

Apply to the Senior Administrative Officer.

CANTERBURY (near). ST. AUGUSTINE'S HOSPITAL, CHARTHAM, near CANTERBURY. JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female) required at this Mental Hospital. Salary scale £775–£1075 p.a. Good resident accommodation available for single person.

Apply to the Medical Superintendent.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (276 Beds.) EAR, NOSE AND THROAT AND EYE DEPARTMENTS. SENIOR HOUSE OFFICER. Salary £745 p.a. Post vacant early December, 1954. Approved for special diplomas.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (276 Beds.) GYNÆCOLOGICAL HOUSE SURGEON required at Highland Court Annexe, a unit of 25 gynæcological beds situated 3 miles from the above Hospital, with all ancillary services available. Recognised for M.R.C.O.G. 6 months appointment. Post vacant early December, 1954. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (276 Beds.) GENERAL SURGICAL AND ORTHOPÆDIC HOUSE SURGEON. The above post, which is recognised for the F.R.C.S. Diploma, is now vacant. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (276 Beds.) SENIOR HOUSE PHYSICIAN. The above post becomes vacant early in December, 1954. Salary £745 p.a., together with National Health Service conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN. (840 Beds.) Applications are invited for the post of HOUSE PHYSICIAN for general medical duties. Applicants must have completed 12 months pre-registration service.

Applications, stating age, qualifications and experience, together with 3 recent testimonials, should be sent to the Group Secretary by 13th November, 1954.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications invited for the post of ANÆSTHETIC REGISTRAR, vacant 1st February, 1955. The Hospital is recognised for the F.F.A.R.C.S. and D.A.

Application forms obtainable from the Group Secretary, Management Committee Offices, St. Helier Hospital. Completed forms to be returned not later than 20th November.

CHELMSFORD. ST. JOHN'S HOSPITAL. Resident OBSTETRIC HOUSE SURGEON (Senior House Officer grade). Recognised by the Royal College of Obstetricians and Gynæcologists for training for D.Obst.R.C.O.G. and M.R.C.O.G. (Obstetrics). Appointment commences 22nd November, 1954. The Department consists of 77 Beds and offers excellent facilities for training.

Applications, stating age, nationality, qualifications, and experience, together with recent testimonials, should be received not later than 10th November by R. G. MORRISH, Secretary, Chelmsford Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. Applications are invited for the post of HOUSE PHYSICIAN (first, second, or third post), Male or Female, commencing 23rd November, 1954.

Applications, stating age, nationality, qualifications and experience, together with copies of recent testimonials, should be received not later than 9th November by R. G. MORRISH, Secretary, Chelmsford Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHELMSFORD HOSPITALS. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer) to large surgical units, for a period of 12 months.

Applications, stating age, sex, qualifications, and experience with recent testimonials, should be sent to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHESTERFIELD ROYAL HOSPITAL. Casualty Officer required at above Hospital. Pre-registration post, or Senior House Officer if person appointed has sufficient experience, and recognised for F.R.C.S. training. Duties include assistance in Accident and Orthopædic Department. National salary and conditions.

Please apply M. H. BOONE, Secretary, Chesterfield Hospital Management Committee.

COLCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts :—

Myland Hospital, Colchester (154 Beds)

RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female) required for tuberculosis and general wards. Also duties at Colchester Chest Clinic.

Harwich and District Hospital, Dovercourt (30 Beds)

SENIOR HOUSE OFFICER (Resident Surgical Officer). Post tenable for 1 year.

Applications, with copies of 3 testimonials, to the Group Secretary, 14, Pope's-lane, Colchester, Essex.

COLCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts :—

Essex County Hospital, Colchester (188 Beds)

HOUSE OFFICER (surgical), first, second, third, or pre-registration post ; tenable for 6 months.

Black Notley Hospital, Braintree (544 Beds)

HOUSE OFFICER (orthopædic surgery), first, second, third, or pre-registration post ; tenable for 6 months. Recognised for F.R.C.S.

Applications, with copies of 3 testimonials, to the Group Secretary, 14, Pope's-lane, Colchester, Essex.

COVENTRY. GROUP 20 HOSPITAL MANAGEMENT COMMITTEE invite applications for the following posts, namely :—

Coventry and Warwickshire Hospital, Coventry (345 Beds)

JUNIOR HOSPITAL MEDICAL OFFICER (ophthalmology—36 Beds). Large Outpatient Department. Recognised for D.O. Previous experience desirable.

HOUSE OFFICER (ophthalmology—36 Beds). Recognised for D.O. Post provides excellent experience in inpatient and outpatient work.

Hospital of St. Cross, Rugby (152 Beds)

CASUALTY AND ACCIDENT SURGEON. To include duties in the Orthopædic Department. Salary £775–£1075 p.a. Resident.

Applications to the Secretary, Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry.

CROWTHORNE, BERKSHIRE. BROADMOOR INSTITUTION. (920 Beds.) BOARD OF CONTROL. REGISTRAR at above Institution for persons of unsound mind of criminal tendencies. Applicants must be registered medical practitioners. Appointment on National Health Service conditions of service and superannuation regulations. Furnished quarters available at appropriate charge.

Applications, stating name, date and place of birth, nationality, details of education, professional qualifications, war service, present and previous appointments, and names of 3 referees, to Medical Superintendent, Broadmoor Institution, Crowthorne, Berks, by 26th November, 1954. Envelope to be marked A/R. Canvassing in any form leads to disqualification. Candidates may visit Institution by appointment with Medical Superintendent.

CROYDON. MAYDAY HOSPITAL. (618 Beds.) House PHYSICIAN (pre-registration) for period of 6 months from 1st December, 1954.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, London-road, Croydon, to be returned as soon as possible.

CROYDON GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Radiology (diagnostic). Whole-time, non-resident, for Group. Candidates should have a Diploma in Radiology. Hospitals in Group may be visited by appointment with Radiologist.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned immediately.

DARLINGTON DISTRICT HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER. This is a joint post between Hundens Unit (a hospital of Special Departments) serving E.N.T., ophthalmic, infectious diseases and chest, and East Haven (geriatrics). Good experience with responsibility for suitable candidate. Post is resident at Hundens Unit (single accommodation) and is for 4 years with option of reappointment. Salary £775–£50–£1075 p.a.

Applications should be sent forthwith, giving full particulars and 3 names for reference, to the Group Secretary, Darlington Memorial Hospital.

DARTFORD HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (specialty—general surgery) required at The West Hill Hospital, Dartford, which is a large general hospital recognised for the F.R.C.S.

Applications, with full particulars, should be sent to the Group Secretary, The Bow Arrow Hospital, Dartford, Kent.

HOUSE SURGEON (general) required at The West Hill Hospital, Dartford. The post is recognised for F.R.C.S. Diploma, and is approved for pre-registration purposes.

Applications, with full particulars, to be sent to the Surgeon-Superintendent, The West Hill Hospital, Dartford, Kent.

DERBY. DERBYSHIRE ROYAL INFIRMARY. House SURGEON (general surgery), pre-registration, vacant 1st December, 1954.

Applications, with copies of 2 testimonials, to be sent to Hospital Secretary.

DONCASTER ROYAL INFIRMARY. Doncaster Hospital MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Ophthalmology. Post vacant end of November. Recognised for D.O.

Applications to the Secretary to the Committee, at the Doncaster Royal Infirmary.

DONCASTER ROYAL INFIRMARY. (330 Beds.) DONCASTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON, vacant beginning of December. Approved as pre-registration post and recognised for F.R.C.S.

Applications to the Secretary to the Committee, at the Doncaster Royal Infirmary.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. *(160 Beds.) Applications invited for post of* RESIDENT ANÆSTHETIST. Candidates should have completed pre-registration service. The post is now vacant. 2500 surgical operations carried out annually. Resident medical staff of 4. Salary £525 p.a., less £125 p.a. deducted for residence. Duties include rota duty in the medical wards and casualty.

Applications, with copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Isle of Man.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP. BIRMINGHAM REGION. Applications invited from registered practitioners, for following appointments :—

The Guest Hospital, Dudley (154 Beds)

SENIOR HOUSE OFFICER (Anæsthetist). Post now vacant.

Wordsley Hospital, near Stourbridge (478 Beds)

SENIOR HOUSE OFFICER (resident), Anæsthetist. Post now vacant. In addition to general surgery, experience is available in gynæcology and there is a major Orthopædic Unit. Regional Plastic Surgery Unit at this Hospital.

SENIOR HOUSE OFFICER (surgical).

Applications, stating age, experience, with copies of 3 recent testimonials, to Group Secretary, The Guest Hospital, Dudley, Worcs.

DORKING GENERAL HOSPITAL, Horsham-road, DORKING. SENIOR HOUSE OFFICER (obstetrics and gynæcology) required 1st December. Post recognised D.Obst.R.C.O.G.

Apply Medical Superintendent.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) RESIDENT OBSTETRIC HOUSE SURGEON for above Hospital. Post vacant 7th December, 1954, and is recognised for the M.R.C.O.G. 6 months appointment.

Applications, stating age, qualifications, experience and enclosing copies of 3 recent testimonials, to Medical Director of Hospital by 20th November, 1954.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) RESIDENT GYNÆCOLOGICAL HOUSE SURGEON for above Hospital. Post vacant 2nd December, 1954, and is recognised for the M.R.C.O.G. 6 months appointment.

Applications, stating age, qualifications, experience, and enclosing copies of 3 recent testimonials, to Medical Director of Hospital by 20th November, 1954.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) RESIDENT HOUSE SURGEON (general and genito-urinary surgery) for above Hospital. Post vacant 23rd December, 1954, and is recognised for pre-registration purposes and for the F.R.C.S. 6 months appointment.

Applications, stating age, qualifications, experience and enclosing copies of 3 recent testimonials, to Medical Director of Hospital by 20th November, 1954.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) RESIDENT HOUSE PHYSICIAN for above Hospital. Post vacant early in December, 1954. Duties will be mainly in the Thoracic and Dermatological Departments. 6 months appointment.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 20th November, 1954.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER required in the Department of Anæsthesia, vacant 15th November, 1954. 12 months appointment. The post is recognised for the D.A. and F.F.A.R.C.S. and affords a wide range of practical experience and tuition under Consultant supervision.

Applications, giving names and addresses of 2 referees, to the Secretary of the Management Committee.

FAREHAM, HAMPSHIRE. KNOWLE HOSPITAL. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Mental Hospital, where all forms of modern psychiatric treatment are undertaken. Terms and conditions of service as approved for hospital medical staff employed in the National Health Service. Salary £775–£50–£1075 p.a. Single residential accommodation is available, but Officers who so desire may live outside the Hospital.

Applications should be sent without delay to the Physician-Superintendent. M. WALSH, Group Secretary,
Knowle Hospital Management Committee.

FARNBOROUGH HOSPITAL, Farnborough, Kent. (800 Beds.) ORTHOPÆDIC SENIOR HOUSE OFFICER required immediately for 1 year. Deduction for residence £150.

Apply, stating age, qualifications with dates, experience, and naming 3 referees, to the Administrative Officer.

GLASGOW OPHTHALMIC INSTITUTION. (Eye Department of GLASGOW ROYAL INFIRMARY.) HOUSE OFFICER required for 6 months commencing 1st February, 1955.

Apply to the Medical Superintendent, Glasgow Royal Infirmary, 84, Castle-street, Glasgow, C.4.

GLASGOW, N. STOBHILL GENERAL HOSPITAL. Applications are invited now for the post of HOUSE OFFICER in the Phthisis Unit (32 Beds) and should be addressed to the Medical Superintendent.

GLASGOW, N.1. STOBHILL GENERAL HOSPITAL. Vacancies for HOUSE OFFICERS (pre-registration) exist in the following units, for the term beginning 1st February, 1955.

Surgery ; E.N.T. ; Dermatology ; Psychiatry.

Applications should be sent to the Medical Superintendent.

GRIMSBY GENERAL HOSPITAL. Grimsby Hospital MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER for casualty duties required immediately. Resident post. Recognised by Royal College of Surgeons for the Final Fellowship examination. Hours : Normally 9 A.M.–6 P.M. Monday–Friday ; 9 A.M.–12 NOON Saturday, sharing night duty on rota with all other resident staff. Establishment consists of Senior Hospital Medical Officer (casualty) and the post now being advertised. Good Medical Library and quiet study room available.

Applications, with the names and addresses of 2 referees, to the Hospital Secretary, Grimsby General Hospital.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (232 Beds.) RESIDENT HOUSE SURGEON required for general surgery. Post is vacant on 1st December and tenable for 6 months. It is approved for pre-registration practitioners and recognised for the F.R.C.S. examination.

Applications, with copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HOUSE PHYSICIAN (resident) required, Male or Female. Pre-registration post, vacant 6th December. National scale of salary.

Apply to Hospital Administrator.

HILLINGDON HOSPITAL, Uxbridge, Middlesex. (705 Beds.) ANÆSTHETIC REGISTRAR required. Hospital may be visited by direct appointment. Resident or non-resident. Recognised for F.F.A.R.C.S. and D.A.

Application forms obtainable from, and returnable to, Group Secretary, Uxbridge Group Hospital Management Committee, The Furze, Pieldheath-road, Uxbridge, Middlesex, by 12th November.

HOVE GENERAL HOSPITAL, Sussex. House Physician (pre-registration), vacant early December. Excellent clinical material available. Post is suitable for candidate working for higher degree. Salary £425–£525, less £125 p.a. for residential emoluments.

Applications, stating usual particulars and naming 2 referees, to the Administrative Officer, within 7 days of this advertisement.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from provisionally registered or registered medical practitioners for the post of HOUSE PHYSICIAN, to commence duties on 1st December, 1954. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

HULL. KINGSTON GENERAL HOSPITAL. (447 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SURGICAL HOUSE OFFICER (mainly gynæcology and orthopædic). Recognised pre-registration appointment. Salary £425, £475, or £525 according to experience. The post is resident and tenable for 6 months. Vacant end November.

Applications, with full particulars, to the Hospital Secretary.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON. The post which will be vacant on 25th November is for a period of 6 months, and counts towards the D.C.H. qualification. Salary according to national scale.

Replies, with testimonials, to be sent to the Hospital Secretary.

IPSWICH. BOROUGH GENERAL HOSPITAL, Heath-road. (273 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (medical). The post, which is vacant on 24th November, is of 6 months duration, and renewable for a further 6 months. This post, which involves Pædiatric Registrar duties, provides excellent opportunities for study for higher qualifications.

Applications, stating age, qualifications and experience, with copies of recent testimonials, to Hospital Secretary.

IPSWICH. BOROUGH GENERAL HOSPITAL, Heath-road, IPSWICH. (273 Beds.) House Surgeon (pre-registration post). Applications are invited for the post of HOUSE SURGEON to General Surgeon vacant on 10th December, 1954. The post, which is recognised for the R.C.S. examinations, is normally of 6 months duration, and is of House Officer grade.

Applications, stating age, experience and qualifications, together with copies of recent testimonials, to Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of HOUSE PHYSICIAN for medical and pædiatric duties, vacant on 16th December, 1954. Approved pre-registration post.

Applications, stating age, nationality and experience, together with copies of 3 recent testimonials, to Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of SENIOR HOUSE SURGEON to the Fracture and Orthopædic Department, vacant on 1st January, 1955. The post is graded Senior House Officer and is recognised for the F.R.C.S. examinations. The Department has 2 Consultants, about 60 beds and a large outpatient attendance; it offers wide experience.

Applications, stating age, nationality and experience, together with copies of recent testimonials, to Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of HOUSE SURGEON to the General Consulting Surgeon. The post is recognised for pre-registration and for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of CASUALTY OFFICER (Senior House Officer grade). The post is recognised for the F.R.C.S. examination.

Applications, stating age and nationality, together with copies of recent testimonials, to Hospital Secretary.

ISLE OF THANET HOSPITAL MANAGEMENT COMMITTEE.

General Hospital, Ramsgate (101 Beds)
HOUSE PHYSICIAN.

General Hospital, Margate (132 Beds)
HOUSE PHYSICIAN.

Approved pre-registration posts. Salary at the rate of £425–£525 p.a., according to experience, less £125 for residential emoluments.

Applications, with copies of testimonials, to Hospital Secretary of appropriate hospital.

LICHFIELD (near). ST. MATTHEW'S HOSPITAL, BURNTWOOD, near LICHFIELD. (1300 Beds.) Whole-time REGISTRAR in Psychiatry. Married quarters available.

Application forms from Group Secretary, General Infirmary, Burton-on-Trent, to be returned before 22nd November, 1954.

LEEDS REGIONAL HOSPITAL BOARD. Short-term LOCUM TENENS appointments in the Registrar grade are constantly available at hospitals in the area of the Board, particularly in the specialties of anæsthetics, general medicine, general and orthopædic surgery, and psychiatry.

Interested practitioners, suitably experienced, should communicate with the Secretary, Joint Registrars Committee, Park-parade, Harrogate.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following REGISTRAR posts:—

Anæsthetics

St. Luke's Hospital, Bradford, and other hospitals in the Bradford A Group (resident).

Dermatology

Duties mainly at the Bradford Royal Infirmary (40 dermatological beds). Large Outpatient Department—5000 new cases annually (resident).

General Medicine

(*a*) Halifax General Hospital (110 general medical beds) (resident).

(*b*) Pontefract and Castleford Group. The person appointed will be required to reside at Ackton Hospital, Featherstone.

(*c*) Hull A Group (non-resident).

General Surgery

(*a*) Halifax Group. Duties mainly at the Royal Halifax Infirmary (110 general surgical beds) (non-resident).

(*b*) Pontefract and Castleford Group (110 Beds) (resident). Furnished house available if required.

Obstetrics and Gynæcology

Huddersfield Group. This post is recognised for the M.R.C.O.G. (resident).

Ophthalmology

(*a*) Huddersfield (22 ophthalmic beds) (non-resident).

(*b*) Halifax and Bradford A Hospital Management Committee Groups. Duties divided equally between Halifax Group (11 eye beds) and Bradford A (34 eye beds).

Orthopædic Surgery

(*a*) Royal Bath Hospital, Harrogate (40 orthopædic beds). Duties in connection with the Regional Rheumatism Scheme (resident).

(*b*) Duties mainly at Pinderfields General Hospital, Wakefield (70 short-stay and 160 long-stay orthopædic beds) and at other hospitals in the Wakefield A and B Groups (resident).

Otolaryngology

Duties at the Hull Royal Infirmary and associated hospitals (50 E.N.T. beds) (non-resident).

Psychiatry

Clifton Hospital, York (1000 Beds) (resident/non-resident). Facilities for attendance at the Leeds University may be provided if the successful candidate is studying for the D.P.M.

Applications, stating age, qualifications, and details of appointments held showing dates, with names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 18th November, 1954.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following SENIOR REGISTRAR posts:—

Chest Diseases

Duties in connection with chest diseases, including pulmonary tuberculosis, in the Leeds Chest Clinic and Killingbeck Hospital, and for non-tuberculous chest diseases in the Leeds Public Dispensary and St. James's Hospital (non-resident). The appointee will be expected to undertake certain duties in the Leeds General Infirmary, where there will be opportunities for close association with the Department of Thoracic Surgery. Good experience in general medicine, and in the diagnosis and management of pulmonary tuberculosis, is essential. Candidates should be in possession of an M.R.C.P. or equivalent qualification. The successful applicant will work under the direction of the Senior Consultant Chest Physician and will fill a vacancy in the Leeds Chest Clinic.

Pathology

Duties at hospitals in the Hull A and B Hospital Management Committee Groups (non-resident). Applicants should have at least 2 years experience in the specialty.

Psychiatry

Senior Registrar in Child Psychiatry (training post in Child Psychiatry). The successful candidate will be employed in the Leeds University Department of Psychiatry, Children's Section, which is associated with Leeds General Infirmary. There may be additional duties at St. James's Hospital, Leeds (adult neurosis work), and at Meanwood Park Colony, Leeds (mental deficiency), if these are regarded as consistent with the candidate's training requirements. The post is non-resident. Candidates must hold the D.P.M. or equivalent qualification.

Applications, stating age, qualifications, and details of appointments held showing dates, with names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 25th November, 1954.

LEEDS. SEACROFT HOSPITAL, York-road. (417 Beds.) SENIOR HOUSE OFFICER for infectious diseases wards (199 Beds). Resident.

Applications, with full details of previous experience and names of 2 referees, to Group Secretary.

LEEDS, 9. ST. JAMES'S HOSPITAL. Leeds A Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female) for the appointment of SENIOR HOUSE OFFICER (orthopædics). The appointment will be for a period of 1 year and the salary will be in accordance with the agreed terms and conditions of service of hospital medical and dental staffs—namely, £745 p.a., with an appropriate deduction in respect of board, lodgings, and other services provided.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS, 12. ST. MARY'S HOSPITAL. (109 maternity beds.) LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female) for the appointment of DEPUTY RESIDENT OBSTETRIC OFFICER (Senior House Officer), vacant January, 1955. The appointment will be for a period of 1 year and is recognised by the Royal College of Obstetricians and Gynæcologists for membership. The salary will be in accordance with the agreed terms and conditions of service of hospital, medical and dental staffs—namely £745 p.a. with an appropriate deduction in respect of board, lodging, and other services provided.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEIGH INFIRMARY, Leigh.

HOUSE SURGEON.

HOUSE PHYSICIAN.

Pre-registration posts, vacant 1st December, 1954.

Applications to Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan-lane, Wigan.

LIVERPOOL, 20. BOOTLE HOSPITAL. House Physician required to commence on 1st January, 1955. Post recognised for Pre-registration Service.

Applications to Secretary, Walton Hospital, Liverpool, 9, stating experience and qualifications and names of 2 referees.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. LIVERPOOL EAR, NOSE AND THROAT INFIRMARY. Applications are invited for a post of SENIOR HOUSE OFFICER in Otorhinolaryngology for the period to 30th September, 1955.

Apply as soon as possible on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for a post of REGISTRAR in Orthopædic Surgery for the year commencing 1st January, 1955. Reappointment until the end of the normal period of training will be considered without need for further application.

Apply by 17th November, 1954, on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for the post of SENIOR HOUSE OFFICER in Pathology with duties at the Liverpool Maternity Hospital for the period to 30th September, 1955.

Apply by 17th November, 1954, on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire. Applications are invited for the post of HOUSE PHYSICIAN. Recognised as pre-registration post. Now vacant.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent now to the Secretary.

MITCHAM. CUMBERLAND HOSPITAL, Whitford GARDENS, MITCHAM, SURREY. (100 Beds.) SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of MEDICAL OFFICER (Registrar) in Tuberculosis, resident, or non-resident if within 5 mile radius of Hospital. Duties also in Thoracic Unit, St. Helier Hospital. Experience in specialty essential.

Forms of application, returnable by 19th November, obtainable from the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

MANSFIELD AND DISTRICT GENERAL HOSPITAL. (205 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT MEDICAL REGISTRAR required with duties also at Victoria Hospital, Mansfield (290 Beds). This post offers experience in general medicine and pædiatrics. Married quarters may be available. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 15th November, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

MAIDSTONE. PRESTON HALL HOSPITAL, British LEGION VILLAGE, MAIDSTONE, KENT. Applications are invited for the appointment of SENIOR HOUSE OFFICER. Salary £745 p.a., national scale and conditions. The sanatorium contains 330 Beds for the treatment of tuberculosis and includes a major Thoracic Surgical Unit.

Applications, stating age, qualifications, and names of 2 referees, to be sent not later than 30th November, 1954, to—

A. A. HOWICK, Group Secretary.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON in the E.N.T. Department of the above Hospital. Post vacant December, 1954. There are 55 E.N.T. beds and 6 specialist operating sessions each week. *Valuable experience is available, and the post is recognised for* the purpose of the F.R.C.S. and the D.L.O. Salary will be £745 a year, less £150 a year for residential emoluments.

Applications to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Maidstone, Kent.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the non-resident post of REGISTRAR in General Medicine, to the Blackpool and Fylde Group of hospitals, with main duties at Victoria Hospital, Blackpool.

Applications, together with copies of 2 recent testimonials, *should be sent to the Group Secretary, Blackpool and Fylde* Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of RESIDENT REGISTRAR in Anæsthetics with main duties at Park Hospital, Davyhulme. There is a non-tuberculous Thoracic Surgery Unit of 50 Beds at the Hospital. Appointment for 1 year in first instance, renewable. Post vacant 31st January, 1955.

Application forms from Secretary, Park Hospital, Davyhulme.

MANCHESTER REGIONAL HOSPITAL BOARD. Wigan AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR in Radiodiagnosis required for duties mainly at the Royal Albert Edward Infirmary, Wigan (resident or non-resident). Post now vacant. Applicants should preferably hold the D.M.R. (D.).

Applications, giving the names of 2 referees, should be sent to the undersigned as soon as possible.

Knowsley House, Wigan. T. W. HURST, Group Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS. FIRST ASSISTANT (Registrar grade). There is an immediate vacancy in this grade and applications are invited from suitable candidates. Salary at national scale. There is an establishment of 4 "First Assistants"—2 of Senior Registrar grade, and 2 of Registrar grade. Initially the appointment will be for 1 year, renewable normally for a second year. The post is non-resident. The duties include very considerable clinical responsibility for obstetrical and gynæcological cases, including cases dealt with in the "Flying Squad" service. The supervision of house officers and some teaching of undergraduate medical students are also involved. Candidates must therefore have had full previous experience in obstetrics and gynæcology. A higher qualification is desirable.

Forms of application may be obtained from the undersigned. The closing date is 22nd November, 1954.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. Applications are invited for the post of HOUSE SURGEON for general surgery and urology. Vacant 1st December. Recognised for the Final F.R.C.S. in general surgery, and recognised as a pre-registration appointment.

Applications, accompanied by 2 testimonials, to be forwarded to the Resident Medical Officer by 24th November, 1954.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. Applications are invited for the post of HOUSE PHYSICIAN to the Radiotherapy Department, vacant 1st December. This post is recognised as a pre-registration appointment.

Applications, accompanied by 2 testimonials, to be forwarded to the Resident Medical Officer by 24th November, 1954.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. (555 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required in the X-ray Diagnostic Department at above Hospital for 1 year in first instance.

Application forms obtainable from, and returnable to, the Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex. Hospital may be visited by direct appointment.

NOTTINGHAM AND MIDLAND EYE INFIRMARY. Required, SENIOR HOUSE OFFICER and HOUSE SURGEON for the above Hospital. Duties to commence immediately. Salaries and conditions of service in accordance with Ministry regulations.

Applications, stating age, qualifications and experience, together with testimonials, to be sent as soon as possible to—

HENRY M. STANLEY, Group Secretary.

General Hospital, Nottingham.

NOTTINGHAM CHILDREN'S HOSPITAL. (136 Beds. Recognised for the D.C.H.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (surgical), which is vacant at the beginning of December. The post is tenable for 6 months or a year by agreement.

Applications, with copies of 2 testimonials, should be sent to the Secretary, Nottingham Children's Hospital, Chestnut-grove, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR ORTHOPÆDIC AND FRACTURE HOUSE OFFICER (locum tenens considered). The post offers exceptional experience in traumatic surgery. Duties to commence at the end of November. Salary and conditions of service in accordance with Ministry regulations. If resident £150 deducted for emoluments.

Applications, stating age, qualifications and experience, together with copies of testimonials to be sent to—

HENRY M. STANLEY, Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered general practitioners for the post of THIRD CASUALTY OFFICER (Senior House Officer grade). Salary (less £150 emoluments) and conditions of service in accordance with those laid down by the Ministry. Duties to commence as soon as possible. This post offers wide experience of casualty work. The staff establishment requires only 1 night in 3 emergency work, and off duty permits time for study for higher examinations.

Applications, stating age, qualifications and experience, *together with copies of testimonials, to be sent to*—

General Hospital, Nottingham. HENRY M. STANLEY.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners (Male or Female—locum tenens considered) for the post of RESIDENT SENIOR ANÆSTHETIC HOUSE OFFICER. Duties to commence as soon as possible. Terms and conditions of service in accordance with published regulations of the Ministry of Health, £150 deducted for residential emoluments.

Applications, stating age, qualifications and experience, *together with copies of testimonials, to be sent to*—

HENRY M. STANLEY, Group Secretary.

NOTTINGHAM. MAPPERLEY HOSPITAL. (1067 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR (psychiatry) required. Single accommodation available. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 15th November, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NEATH GENERAL HOSPITAL, Neath. (412 Beds.) MID-GLAMORGAN HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (paediatrics). This Hospital is recognised for the principal diplomas, including the D.C.H.

Applications, naming 2 referees, to be addressed to the Group Secretary of the Committee, 8, Wind-street, Neath.

NEWCASTLE REGIONAL HOSPITAL BOARD. Special AREA FOR CUMBERLAND AND NORTH WESTMORLAND. EAST CUMBERLAND GROUP OF HOSPITALS. SURGICAL REGISTRAR (resident) required for 1 year in the first instance, with the likelihood of extension. Main duties at the Cumberland Infirmary, Carlisle (322 Beds), where the Registrar will have duties in the Casualty Department and in the wards.

Applications, together with names and addresses of 1–3 referees, and/or 1–3 testimonials, to the Senior Administrative Medical Officer, 1, Lonsdale-street, Carlisle, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Cleve- LAND HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR PÆDIATRICIAN (whole-time), resident, at the Children's Hospital, Stockton-on-Tees (74 Beds). Well-furnished married quarters available. Appointment for 1 year in the first instance and may be renewed for a further period.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 7 days.

NEWPORT, MONMOUTHSHIRE. ROYAL GWENT HOSPITAL. (260 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER (E.N.T. and ophthalmic) required about 1st November. National salary, less £125 board-residence. Grade depends on period since qualification. Recognised D.L.O. Covers 23 E.N.T. and 8 eye beds.

Write, quoting 2 referees, to T. A. JONES, Group Secretary. 64, Cardiff-road, Newport, Mon.

ORPINGTON HOSPITAL, Orpington, Kent. Casualty OFFICER (Senior House Officer grade), preferably resident, required as from 1st January, 1955, for above General Hospital of 813 Beds. Post recognised for F.R.C.S.

Applications with usual details to Physician-Superintendent.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited for post of HOUSE SURGEON to the Accident Service, Radcliffe Infirmary, for 6 months with effect from 1st December, 1954 (45 Beds). Duties include 2 months head injuries, 2 months male and 2 months female and children's ward, in addition to Casualty Department.

Apply, stating age, qualifications and experience, together with names of 2 referees, to Administrator, Radcliffe Infirmary, Oxford, by 20th November, 1954.

OXFORD. UNITED OXFORD HOSPITALS. Vacancy in X-Ray Department with effect from 1st January, 1955, for Trainee SENIOR HOUSE OFFICER in Diagnostic Radiology. Previous experience not essential.

Applications, stating age, qualifications and experience, together with names of 2 referees, to Administrator, Radcliffe Infirmary, Oxford, by 20th November.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited for post of REGISTRAR (resident) to the Accident Service of the Radcliffe Infirmary, with effect from 1st January, 1955. Appointment for 1 year and eligible for extension to second year.

Applications on forms obtainable from Administrator, Radcliffe Infirmary, Oxford, should be received by him not later than 25th November.

PETERBOROUGH. THE MEMORIAL HOSPITAL. PETERBOROUGH AND STAMFORD HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (orthopædics). Applications are invited for this position, vacant 16th November, 1954. Exceptional experience offered in busy department.

Apply to the Secretary, Memorial Hospital, Peterborough.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. HOUSE OFFICER in Obstetrics, at the Alexandra Maternity Home, Devonport, vacant November, 1954.

Applications, stating age, nationality, qualifications, and experience, with names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary, Plymouth, South Devon and East Cornwall General Hospital Group. 7, Nelson-gardens, Stoke, Plymouth.

POOLE GENERAL HOSPITAL, Longfleet-road, Poole, DORSET. (306 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT ANÆSTHETIST (Senior House Officer). The post, which is now vacant, is recognised for the D.A. and F.F.A.R.C.S.

Applications to the Hospital Secretary.

RICHMOND, SURREY. CASSEL HOSPITAL FOR FUNCTIONAL NERVOUS DISORDERS, SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of PSYCHIATRIC REGISTRAR. Candidates must have special interest in psycho-analysis and experience in psychotherapy. Candidates may visit the Hospital by appointment.

Application forms may be obtained from the undersigned and should be returned to the Secretary within 14 days of the appearance of this advertisement.

D. MALLION, Secretary,
Cassel Hospital Management Committee.
Ham Common, Richmond, Surrey.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Saint Mary's Hospital
HOUSE PHYSICIAN, vacant 14th December, 1954. Pre-registration post.

Queen Alexandra Hospital
HOUSE PHYSICIAN, vacant 29th December, 1954. Pre-registration post.

Royal Portsmouth Hospital
HOUSE PHYSICIAN, vacant 1st January, 1955. Pre-registration post.

Applications, stating age, experience and qualifications, together with the names of referees, should be sent as soon as possible to E. H. HURST,
35, Grove-road South, Southsea.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (Area Accident and Orthopædic Department), vacant mid-December. Duties, including casualty work, at Battle Hospital, Reading (343 Beds). Person appointed will work with Registrar and House Officers.

Apply, stating age, nationality, present post, qualifications with dates, together with names of 2 referees, to Group Secretary. 3, Craven-road, Reading.

ROCHDALE. BIRCH HILL HOSPITAL. Rochdale AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required at above Hospital. Pre-registration students eligible. Post recognised for 6 of the 12 months F.R.C.S. experience.

Apply to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancashire, at once with full details.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (603 Beds.) Applications are invited for the post of RESIDENT HOUSE SURGEON (recognised for the F.R.C.S.). The post is vacant from approximately mid-November, and is recognised as a pre-registration post.

Applications, &c. (1 testimonial sufficient for applicants for first appointment) should be sent to the undersigned as soon as possible. J. C. FIELD, Secretary.

SCOTLAND. NORTH-EASTERN REGIONAL HOS- PITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in Anæsthetics on the staffs of the Aberdeen General Hospitals and the Aberdeen Special Hospitals. Candidates preferably should hold a higher qualification in anæsthetics. Salary is within the scale of £1100–£1400 p.a. Terms and conditions are as laid down for hospital medical and dental staffs (Scotland).

Applications, together with the names of 2 referees, should be lodged by 15th November, 1954, with the Secretary, 1, Queen's-gardens, Aberdeen, from whom further particulars may be obtained.

SCOTLAND. SOUTH-EASTERN REGIONAL HOS- PITAL BOARD. Applications are invited for an appointment of Transitional SENIOR REGISTRAR in E.N.T. Surgery to the Edinburgh Northern Group of hospitals. The main duties of the appointment will be in connection with inpatients and outpatients in the Eastern and Western General Hospital, but will include certain duties in peripheral hospitals, primarily in the Scottish Border Counties. The salary for the post will be at the rate of £1400 p.a., the appointment being for a period of 1 year in the first instance. Applicants should have considerable experience in E.N.T. surgery including the holding of a Senior Registrar appointment. The post is subject to the terms and conditions of the National Health Service.

Applications, giving particulars of age, qualifications, and previous experience, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 27th November, 1954.

SCOTLAND. SOUTH-EASTERN REGIONAL HOS- PITAL BOARD. Applications are invited for the appointment of REGISTRAR in Orthopædic Surgery in the Royal Infirmary of Edinburgh.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 27th November, 1954.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance :—

SENIOR REGISTRAR in Biochemistry based at Stobhill Hospital, Glasgow.

SENIOR REGISTRAR in Pathology based at the Western Infirmary, Glasgow, with duties principally at the new hospital, Vale of Leven.

SENIOR REGISTRAR in Bacteriology based at the Western Infirmary, Glasgow, with duties principally at the new hospital, Vale of Leven.

SENIOR REGISTRAR in Psychiatry based at Stobhill Hospital, Glasgow. Applications from Registrars at present in general medicine would be considered.

SENIOR REGISTRAR in Psychiatry based at Hawkhead Mental Hospital, Glasgow. Applications from Registrars at present in general medicine would be considered. Married quarters are available.

REGISTRAR in Pathology based at the Royal Infirmary, Glasgow, which may involve work in the Lanark County Area.

2 REGISTRARS in Pathology based at the Western Infirmary, Glasgow.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, by 27th November, 1954.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Board for a SENIOR REGISTRAR in Virus Diseases at Ruchill Hospital Laboratories. The person appointed will work under the immediate direction of the Glasgow University Lecturer in Virus Diseases and in association with the University of Glasgow Departments of Bacteriology and of Infectious Diseases. Applicants need not have had experience in virus diseases, but a basic training in bacteriology or pathology will be essential. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, by 27th November, 1954.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR HOUSE OFFICER in Surgery at Western District Hospital, Glasgow. The appointment will be for 1 year in the first instance.

Applications, stating age, qualifications, experience, and present appointment and naming 3 referees, to be lodged with the Secretary, Board of Management for Glasgow Northern Hospitals, 13, Woodside-place, Glasgow, C.3, not later than 16th November, 1954.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON (obstetric and gynæcological unit). Applications are invited for the above post which is open to pre-registration candidates and which becomes vacant at the end of December, 1954. The Unit comprises 40 obstetric and 35 gynæcological beds and is recognised for the Diploma and Membership of the Royal College.

Applications, stating age, nationality, qualifications, experience, and naming 2 referees, to the Group Secretary, Odstock Hospital, Salisbury.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications are invited for the following non-resident posts :—

(*a*) SENIOR REGISTRAR in Radiology at the Royal Hospital/Royal Infirmary Units. Candidates should hold a Diploma in Diagnostic Radiology. The appointment is for 1 year in the first instance and will be reviewed annually. It has been agreed in principle between the Board of Governors of The United Sheffield Hospitals and the Sheffield Regional Hospital Board that the appointment, if extended to the full period of 4 years, will be divided, subject to satisfactory work and progress, between The United Sheffield Hospitals and a hospital in the Region.

Closing date for applications 15th November, 1954.

(*b*) REGISTRAR to the Ophthalmic Department at the Royal Hospital Unit. Post vacant 16th February, 1955.

Applications to be sent immediately.

Applications for the above posts should state age, qualifications, and experience, give the names of 3 referees, and be sent to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SOUTHAMPTON EYE HOSPITAL. (32 Beds. Recognised for the D.O.M.S.). RESIDENT SENIOR HOUSE OFFICER required immediately. Salary £745 p.a.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON GROUP OF HOSPITALS. South West METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in Pathology to the above Group. This post offers wide experience in all branches of pathology and facilities for research. Candidates may visit the hospitals concerned, by prior arrangement, if they so desire.

Forms of application, to be returned by not later than 20th November, may be obtained from the undersigned.

FRANK JENNINGS, Group Secretary,
Southampton Group Hospital Management Committee,
Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds. Recognised for F.R.C.S.) RESIDENT HOUSE SURGEON required mid-December. Pre-registration candidates eligible.

Applications, with copies of testimonials, should be forwarded to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton, as soon as possible.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) 2 HOUSE PHYSICIANS (resident) required beginning of December. Pre-registration candidates eligible. Posts tenable for 6 months.

Applications, with copies of testimonials, should be forwarded to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton, as soon as possible.

STRATFORD-ON-AVON GENERAL HOSPITAL. (187 Beds.) SENIOR HOUSE OFFICER (resident Medical Officer) required. Post vacant 1st December, 1954. Duties on medical wards under supervision of Consultant staff. Appointment gives good experience in general medicine and suitable for one working for a higher qualification. 2 other resident staff.

Applications, giving qualifications and experience, together with copies of 2 testimonials, to the Hospital Secretary as soon as possible.

ST. ALBANS (near), HERTFORDSHIRE. SHENLEY HOSPITAL. (2284 Beds. 16 miles from London.) **NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.** SENIOR HOUSE OFFICER (psychiatric). Applications are invited for the above post, resident or non-resident, for 1 year in the first instance, at above Hospital. Opportunity for work with neurotic as well as psychotic patients, and full facilities for D.P.M. training. The Hospital may be visited by appointment.

Applications to the Medical Superintendent.

SOUTHEND GENERAL HOSPITAL. Locum Anæsthetic REGISTRAR required from 5th December, 1954, until a permanent appointment is made by the Regional Hospital Board.

Applications, stating age, qualifications, &c., to be sent to the undersigned as soon as possible. J. C. FIELD, Secretary.

SOUTHPORT GENERAL INFIRMARY. (195 Beds.) HOUSE SURGEON (recognised for pre-registration). Post vacant mid-December.

Apply, stating age, qualifications, experience, and nationality, with copies of 2 testimonials, to—

T. CROOK, Group Secretary,
Southport and District Hospital Management Committee.
Promenade Hospital, Southport.

STOCKPORT AND BUXTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the non-resident post of SENIOR HOUSE OFFICER to the E.N.T. Departments in the Group.

Applications, stating age, nationality, and qualifications, together with the names of 2 referees or copies of 2 testimonials, to be addressed to the undersigned immediately.

59B, Shaw-heath, Stockport. H. G. PRICE, Secretary.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for HOUSE OFFICER (general surgery), vacant end November. Hospital recognised for F.R.C.S. examinations and the post is recognised for experience during the pre-registration period.

Apply, with copy testimonials, stating age, nationality, and full details of previous service, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for RESIDENT ASSISTANT CLINICAL PATHOLOGIST to the Stoke-on-Trent Group of hospitals, vacant now. Single accommodation available at the North Staffs Royal Infirmary. The post is of Junior Hospital Medical Officer status, but applications from practitioners with less than the required 2 years qualification period will be considered, in the grade of Senior House Officer. The post offers exceptional experience in hospital laboratory work and the laboratory is recognised for the Diploma in Clinical Pathology and also for the Diploma in Pathology.

Applications, stating age, nationality, and full details of previous appointments held, together with copies of 3 recent testimonials, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required in Unit of Obstetrics and Gynæcology. Post recognised for M.R.C.O.G.

Applications, stating age, experience, and qualifications with dates, and copies of 2 testimonials, to Hospital Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for post vacant 1st January. Preference given to persons seeking pre-registration post under Medical Act, 1950.

Applications, stating age, qualifications with dates, with copies of 2 testimonials, to Hospital Secretary.

TAUNTON HOSPITAL MANAGEMENT COMMITTEE. TAUNTON AND SOMERSET HOSPITAL. Applications are invited for the following medical appointments becoming vacant on the dates stated :—

HOUSE OFFICER (medical), vacant from 1st January, 1955.
HOUSE OFFICER (pædiatric). Recognised for the D.C.H. Vacant from 5th January, 1955.
HOUSE OFFICER (surgical). Recognised for F.R.C.S. Vacant from 26th December, 1954.
SENIOR HOUSE OFFICER (pathology), vacant from 1st January, 1955.

All House Officer appointments are recognised for pre-registration candidates.

Applications, stating age, nationality, and qualifications, together with the names of 2 referees, should be forwarded, to reach the Group Secretary, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset, not later than 27th November, 1954.

TORQUAY. TORBAY HOSPITAL. Resident Casualty OFFICER (Senior House Officer status) required immediately.

Applications, stating qualifications, nationality, age, with copies of testimonials (quoting ref. F955/48), to the Group Secretary, Torquay District Hospital Management Committee, 62/64, East-street, Newton Abbot, S. Devon.

WARWICK (near). CENTRAL MENTAL HOSPITAL. SENIOR HOUSE OFFICER required in this Mental Hospital of 1400 Beds with Neurosis Unit, 4 adult and 2 child psychiatry clinics recognised for the D.P.M. Departments of Electro-encephalography. Occupational Therapy, Psychology and social work. A modern house is available.

Applications, together with the names and addresses of 3 referees, to the Medical Superintendent.

WATFORD AND DISTRICT PEACE MEMORIAL HOSPITAL, Rickmansworth-road, **WATFORD, HERTS.** (198 Beds.) Applications are invited for the post of CASUALTY OFFICER AND ORTHOPÆDIC HOUSE SURGEON. The post is either resident or non-resident and is vacant immediately. Salary £425–£525, according to experience, less £125 per year if resident.

Applications, with copies of 2 recent testimonials, should be sent to CYRIL HOPKINSON, Administrator.

WATFORD AND DISTRICT PEACE MEMORIAL HOSPITAL, Rickmansworth-road, **WATFORD, HERTS.** (198 Beds.) Applications are invited from registered medical practitioners for the pre-registration post of HOUSE SURGEON, vacant the end of November. Salary according to the National Health Service scale.

Applications, together with copies of 2 recent testimonials to—

CYRIL HOPKINSON, Administrator.

WARRINGTON INFIRMARY. Applications are invited from qualified practitioners for the vacancy of RESIDENT ANÆSTHETIST (Senior House Officer grade), Male or Female, at the Warrington Infirmary. The Infirmary is recognised for the *D.A.* examination. Scale of salary £745 p.a., less £130 p.a. for residential emoluments.

Applications to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WELSH REGIONAL HOSPITAL BOARD.

NON-RESIDENT REGISTRAR (anæsthetics) Caernarvon and Anglesey General Hospital, Bangor. Post recognised for F.F.A. R.C.S.

REGISTRAR in Orthopædic Surgery based at Rhyl, to serve Clwyd and Deeside Hospital Management Committee. Also required assist in treatment of long-stay orthopædic cases at area sanatoria.

Subject to review end of first year.

Forms of application from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY AND WHELLEY HOSPITAL. (279 Beds.) SENIOR HOUSE OFFICER (medicine) required. Post vacant 1st December, 1954. Good experience for higher qualifications.

Applications to Secretary, Wigan Infirmary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (311 Beds.) HOUSE PHYSICIAN required, vacant 1st January, 1955. May be pre-registration post.

Applications, with copies of 2 testimonials, to the Secretary.

WOKING AND CHERTSEY GROUP HOSPITAL MANAGEMENT COMMITTEE. ST. PETER'S HOSPITAL, WOKING AND CHERTSEY GROUP (404 Beds); ROYAL SURREY COUNTY HOSPITAL, GUILDFORD GROUP (229 Beds). Full-time E.N.T. REGISTRAR required for above and other hospitals in Groups concerned. Recognised for F.R.C.S. and D.L.O.

Application forms can be obtained from, and should be returned by 20th November, 1954, to, Secretary, Woking and Chertsey Hospital Management Committee, "Huntington" Chertsey, Surrey. The hospitals may be visited by arrangement (Tel. Nos.: St. Peter's, Ottershaw 441; Royal Surrey County, Guildford 2323).

WOLVERHAMPTON GROUP.

The Royal Hospital, Wolverhampton (An Associated Hospital of the University of Birmingham Medical School) HOUSE OFFICER (casualty), vacant mid-November.

Wolverhampton and Midland Counties Eye Infirmary (Recognised for F.R.C.S. and D.O. examinations) SENIOR HOUSE OFFICER, vacant now.

Applications, with copies of 3 recent testimonials, to be sent to Group Secretary, The Royal Hospital, Wolverhampton.

WORKSOP. VICTORIA HOSPITAL. (127 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required with some duties also at Kilton Hospital, Worksop (190 Beds). There are 125 acute surgical beds at these hospitals and the post offers broad training in general surgery, E.N.T., orthopædic and traumatic surgery. Appointment for 1 year in first instance.

Apply Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 15th November, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

YORKSHIRE. EAST RIDING HOSPITAL MANAGEMENT COMMITTEE.

Westwood Hospital, Beverley, Yorks (229 Beds)

(*a*) ASSISTANT PATHOLOGIST (Senior House Officer) required in Area Laboratory, with attendance Branch Laboratory at Driffield. Offers experience all branches pathology.

Northfield Sanatorium, Driffield, Yorks (78 Beds)

(*b*) SENIOR HOUSE PHYSICIAN, vacant now. Offers experience all branches tuberculosis within Group, including surgery, M.M.R. and clinics. Time for study. Ex-patients welcome.

Broadgate (Mental) Hospital, Beverley, Yorks (650 Beds)

(*c*) JUNIOR HOSPITAL MEDICAL OFFICERS (2), required now.

Salary for (*a*) and (*b*) £745 and for (*c*) £775–£50–£1075.

Detailed applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

CANADA. GENERAL HOSPITAL, Kingston, Ontario, teaching hospital of Queen's University, offers JUNIOR ROTATING INTERNSHIPS for 1 year commencing 25th June, 1955. Honorarium $50 per month plus residential emoluments. Senior appointments in various specialties also available.

The Superintendent, Kingston General Hospital, Kingston, Ontario, Canada.

NEWFOUNDLAND. DEPARTMENT OF HEALTH, ST. JOHN'S, NEWFOUNDLAND. GENERAL HOSPITAL. (475 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST. Salary $3600 (£1310) p.a., less $600 (£218) for board, maintenance, &c., previous experience in anæsthetics desirable. The post offers experience for all types of anæsthesia.

Applications, stating age, qualifications and experience, together with the names of 2 referees, should be sent immediately to, Dr. E. WILSON, Superintendent, General Hospital, St. John's, Newfoundland. Transportation to St. John's and return to point of departure will be arranged and paid by the Hospital, with the understanding that the appointee serves for a period of 1 year.

U.S.A. KANSAS MEDICAL CENTER. Approved PSYCHIATRIC RESIDENCIES available immediately or July offering comprehensive clinical training and didactic instruction in child and adult psychiatry.

Apply: Associated Psychiatric Faculties, University of Kansas Medical Center, Kansas City, Kansas, U.S.A.

Public Appointments

AUSTRALIA. GOVERNMENT OF WESTERN AUSTRALIA. PUBLIC HEALTH DEPARTMENT. TUBERCULOSIS CONTROL BRANCH. SENIOR THORACIC SURGICAL REGISTRAR. Applications are invited for the above position. Applicants should have some previous experience of modern techniques in thoracic surgery. A higher surgical qualification is desirable, but not essential. The successful applicant will be required to assist the Thoracic Surgeons and will be responsible for the pre- and post-operative management of the surgical patients in the Thoracic Wing at the Royal Perth Hospital. He will later have the opportunity to work in a new 200-Bed Chest Hospital for which tenders have been invited. He will work under the over-all direction of the Director of Tuberculosis Control, Perth Chest Clinic, 17, Murray-street, Perth, W.A., from whom further inquiries can be made. Salary will be at the rate of £A1870 p.a., subject to basic wage adjustments. A sum up to the maximum of £300 sterling will be allowed for travelling expenses to Western Australia.

Applications should be addressed to the Agent-General for Western Australia, Savoy House, Strand, London, W.C.2, before 27th November, 1954.

BRIGHTON. COUNTY BOROUGH OF BRIGHTON. Applications invited from registered medical practitioners (Female) for appointment as SCHOOL MEDICAL OFFICER AND ASSISTANT to the Medical Officer of Health. The duties are mainly in the School Health Service. Possession of the D.P.H. or D.C.H. an advantage. Salary £950–£50–£1300 p.a.

Application forms and further particulars obtainable from Director of Education, 54, Old Steine, Brighton, to whom applications should be sent within 2 weeks of appearance of advertisement. W. O. DODD, Town Clerk.

CARDIFF. CITY OF CARDIFF. Applications are invited from registered medical practitioners for the appointment of SENIOR MEDICAL OFFICER at a salary of £1250 p.a., rising by annual increments of £50 to £1650. Applicants will be required to carry out general duties in the department and the possession of a Diploma in Public Health is necessary. In addition to having a sound knowledge of all branches of the Public Health and School Health Services, candidates must have had practical experience in mental deficiency, the ascertainment of educationally subnormal children, the examination of other categories of handicapped pupils and the control and prevention of infectious disease. Experience and ability in lecturing to the public and other audiences on health topics will be considered an advantage.

Forms of application may be obtained from the undersigned to whom completed forms should be returned, together with the names and addresses of 2 persons to whom reference may be made, not later than 30th November, 1954, endorsed "Senior Medical Officer." S. TAPPER-JONES, Town Clerk.

City Hall, Cardiff, October, 1954.

DUBLIN. LOCAL APPOINTMENTS COMMISSION. Medical position vacant. PATHOLOGIST, South Cork Board of Public Assistance. Essential qualifications include (i) at least 3 years experience in pathology (ii) M.D., M.Sc., M.R.C.P.I. or equivalent. Salary £1900 a year subject to a reduction if the appointee accepts a University teaching appointment for which he receives payment from the University Authorities.

Application forms and particulars from the Secretary, 45, Upper O'Connell-street, Dublin. Latest time for receiving completed application forms 5 P.M. on 19th November, 1954.

TREASURY MEDICAL SERVICE. Applications are invited from medical practitioners, practising in the districts detailed below, for appointment, in a part-time and mainly advisory capacity, as LOCAL TREASURY MEDICAL OFFICER for each of the places or groups of places shown. The town shown in brackets after the place-names indicates the Head Post Office Area in which the place, or group of places, is situated. Successful applicants will be required to examine and report on the condition of certain Government Officers, teachers, candidates for appointment, &c., who may be referred to them from time to time; and to attend when summoned to an emergency case of accident or sudden illness occurring in a Government office in the neighbourhood. Fees for this work, and mileage allowance where necessary, will be paid on a scale agreed with the British Medical Association.

Intending applicants should write, within 14 days, to Treasury Medical Adviser, Treasury Chambers, Whitehall, S.W.1, for a form on which application may be made. Applicants should be not more than 60 years of age.

The places for which applications are invited are as follows:—

ENGLAND AND WALES

Askern, Campsall, Norton and Womersley (Doncaster).
Loughborough (Loughborough)
Glossop (Manchester).
Failsworth (Manchester).
Sheffield 1, 7, 8, 10, and 11 (Sheffield).

THE MEDICAL SERVICE OF THE ROYAL NAVY

VACANCIES FOR MEDICAL OFFICERS

Candidates are invited, for Short Service Commissions of 4 years, on termination of which a gratuity of £600 (tax free) is payable. Ample opportunity is granted for transfer to Permanent Commissions on completion of 1 year's total service. Officers so transferred are paid instead a grant of £1500 (taxable).

All entrants are required to be British subjects whose parents are British subjects, to be medically fit, and to pass an interview.

Full particulars from the Admiralty Medical Department, Queen Anne's Mansions, St. James's Park, London, S.W.1.

DURHAM. COUNTY COUNCIL OF DURHAM. EDUCATION DEPARTMENT. The County Education Committee invite applications from registered medical practitioners (Men and Women) for appointment as ASSISTANT to Deputy Principal School Medical Officer. Applicants must have had at least 3 years experience in the practice of their profession and have been approved by the Ministry of Education for the ascertainment of pupils needing education in a special school as educationally subnormal children. Commencing salary is £1150 p.a., rising by annual increments of £50 to a maximum of £1450 p.a. The successful candidate will be required to pass a medical examination and to contribute in accordance with the provisions of the appropriate superannuation act.

For conditions of appointment and form of application, which must be returned not later than 4th December, 1954, apply, enclosing stamped and addressed foolscap envelope, to the Director of Education, Shire Hall, Durham.

L. W. DAVIS, Deputy Director of Education.

Shire Hall, Durham, 25th October, 1954.

EDINBURGH. CITY OF EDINBURGH. Public Health DEPARTMENT. Applications are invited for the post of MEDICAL OFFICER in charge of the Mental Health Services Branch of the Public Health Department. Applicants should have had experience in mental health and be particularly interested in the preventive aspects of mental health work. The grading of the post would be that of a Senior Medical Officer, £1250 rising by annual increments of £50 to £1650.

Applications, stating age, qualifications and experience, together with the names of 3 referees, should be sent to the Medical Officer of Health, Johnston-terrace, Edinburgh, 1, not later than 11th December, 1954.

NEWCASTLE. CITY AND COUNTY OF NEWCASTLE UPON TYNE EDUCATION COMMITTEE. Applications are invited from qualified medical practitioners for the post of SCHOOL MEDICAL OFFICER. Salary £950 p.a., rising by annual increments of £50 to a maximum of £1300 p.a. The candidate appointed will be required to contribute under the appropriate superannuation scheme and pass a medical examination. The School Health Service works in close conjunction with the Hospital and Consultant Services of the City and clinical opportunities are made available to members of the staff. Canvassing directly or indirectly will be deemed a disqualification.

Further particulars and form of application may be obtained from the Director of Education, City Education Office, Northumberland-road, Newcastle upon Tyne, 1, and completed applications should be forwarded within 14 days of the appearance of this advertisement to the Principal School Medical Officer, Health Department, Town Hall, Newcastle upon Tyne, 1.

ST. HELENS. COUNTY BOROUGH OF ST. HELENS. HEALTH DEPARTMENT. ASSISTANT MEDICAL OFFICER OF HEALTH (Male or Female). Applications are invited from qualified medical practitioners for the above post at a salary of £950 p.a., rising by annual increments of £50 to £1300 p.a. Recognition may be given to past Local Authority service in fixing the commencing salary. The possession of a C.P.H. or D.C.H. is desirable, but not essential. Consideration for housing accommodation will be given according to the circumstances of the successful candidate.

Application forms and further particulars of appointment may be obtained from the undersigned.

G. O'BRIEN, Medical Officer of Health.

Town Hall, St. Helens, Lancs.

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy"

KINGSHURST HALL ESTATE, (near) CASTLE BROMWICH. Applications invited for VACANCY on new housing estate at Kingshurst Hall, near Castle Bromwich. No list of patients. Estimated population of 1600 by January, 1955, and 3500 by January, 1956. Residence with surgery will be available on tenancy basis. Subject to usual conditions initial practice allowance will be payable. Further particulars obtainable upon request. Applications on Form E.C.16A to reach the undersigned not later than 29th November, 1954.

R. V. NELLTHORP,
Clerk of the Warwickshire Executive Council.

15, Waterloo-place, Leamington Spa.

VENTNOR, ISLE OF WIGHT. Applications are invited for VACANCY (chiefly urban). List at present approximately 2000. Living accommodation with surgery available. Apply on E.C.16A before 22nd November, 1954, to—

W. BELL, Clerk, Isle of Wight Executive Council.

Holyrood Chambers, Newport, Isle of Wight.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies.

The British Council invites applications for the post of Assistant, Medical Department, in their London Headquarters to assist the editorial staff of the British Medical Bulletin. The duties include checking references and marking proofs. Candidates, preferably between 21 and 30, may be men or women, and should be Associates of the Library Association or have had experience on the staff of a medical or scientific journal. They must be able to type, have a knowledge of medical terms, and have experience in using medical libraries and in preparing bibliographical material for the press. Basic starting salary for men at age 21 £5 11s., incrementing to £7 17s., and for women £4 15s. at 21 incrementing to £6 5s. There is a contributory pension scheme. A typing proficiency allowance would be payable to a suitably qualified holder.—Write, quoting "Medical" and enclosing stamped addressed foolscap envelope to The Director, Personnel Department, British Council, 65, Davies-street, London, W.1, for further particulars and application form to be returned completed by 18th November.

West Africa. Locum Tenens required January, 1955, for service with long-established mining Company operating in Sierra Leone and Gold Coast. Surgical experience desirable. Appointment 8 months to a year. Possibility of long-term employment on favourable terms to suitable doctor. Salary and allowances for temporary appointment not less than £200 per month. First-class travelling expenses paid and free furnished bungalow accommodation in permanent self-contained camp. 1 weeks leave on full pay for each months service abroad. If married, wife could accompany appointee. Doctor would be in sole charge of small well-equipped hospital and of the medical care of the European and African personnel and families for a period of approximately 4 months in each Colony. Number of Company employees in each case approximately 40 Europeans and 2000 Africans.—Apply with full details experience, &c., to CONSOLIDATED AFRICAN SELECTION TRUST LIMITED, Mason's-avenue, Coleman-street, London, E.C.2.

The Wellcome Research Laboratories. Applications are invited from Bacteriologists for appointment to a post in these laboratories primarily concerned with the production and testing of bacterial vaccines and toxins, but including opportunity and facilities for research. Applicants should be graduates with some experience in this field, and preferably a senior degree, but medical or veterinary qualifications are not essential.—Applications, giving full personal particulars, including qualifications and experience should be sent to the Head of the Biological Division, The Wellcome Research Laboratories, Beckenham, Kent, from whom further details may be obtained.

A Physician-Anesthetist wanted to work in private medical clinic in East Canadian Province. Remuneration would depend to some extent on the abilities of the candidate but should be in the region of $10,000 p.a. with good prospect of increase. Duties would include medical work at the clinic and anæsthesia. A higher qualification in medicine and/or anæsthesia would be an advantage but not essential for a candidate with experience. An appointment at the local hospital is available.—Candidates should write, giving full details of qualifications and experience, and the names of 2 persons to whom reference can be made, to: Address, No. 980, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Personal Services—Reasonable Terms for: (a) Medical shorthand-typing—occasional/regular engagement; (b) Holiday/sickness relief—quotations hour/day/week; (c) Copy-typing theses, testimonials, &c.—Telephone provisionally WELbeck 6419, 9.30 A.M.–5.30 P.M.

Young lady, S.R.N., N.N.E.B., shorthand-typist (own portable), experienced driver, requires post as Private Secretary-Driver. Willing to travel England or abroad.—Address, No. 982, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Wanted: a reliable woman to take charge of a hostel for old people in New Malden, Surrey. 17 residents. Applicants must be able to cook. Midday meal only. Some nursing experience useful but not essential.—Write: Secretary, 8, Malden road, New Malden, Surrey.

Portland-place, W.1. Attractive flat to let in first-class building with all services, suitable combined residential-professional use. Accomodation 4 bedrooms, 2 bathrooms, 2 reception, 3 staff rooms and usual offices. Rent £1150 p.a.—Managing Agents—MARCUS LEAVER & Co., 42, Sackville-street, W.1 (MAYfair 4266).

Suitable for Residence and Practice. New Cavendish-street, W.1. Modern Maisonette to be let unfurnished. Light spacious rooms. On ground and first-floors.—Further details from ALLIANCE PROPERTY CO., LTD., 12, Carlos-place, W.1 (GROsvenor 3968).

Consulting-rooms, full and part time, and Houses in the medical area.—ELGOOD & Co., 1, Bentinck-street, W.1 (WELbeck 8974).

Surrey/London fringe (Kingston). Solid spacious detached corner house: 3 reception rooms (1 with separate external road access and recess suitable for hand-basin, &c.), 4 main and 3 subsidiary bedrooms, breakfast-room, kitchen, 2 toilets, cloak-room; garage; 1/5th acre garden with fruit trees. Suitable professional man. 10 minutes' walk main line station and near several bus routes. Freehold £4750.—Write Box M/927, Strand House, London, W.C.2.

Free from Boric Acid Taylor's Cimolite Dusting Powder is ideal for the most delicate infant or adult. 1s. 11d. per tin. Obtainable from SAVORY & MOORE, Bond-street, and JOHN BELL & CROYDEN, Wigmore-street, London, W.1.

Austin. The new Cambridge A.40 and A.50 and all Show models. Limited number of orders now acceptable from proven essential users.—Application form, brochures, easy terms, from Austin House, 140/144, Golders Green-road, Golders Green, London, N.W.11.

For sale. 4-valve Dean's Diagnostic X-ray Unit. Com-prising tilting table, tomograph, screening stand, Hodgson sinus stand, &c.—Address, no. 984, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Cardiologist's screening apparatus and direct writer Cambridge Portable E.C.G. for sale. Can be viewed in Harley-street.—Apply: Address, No. 983, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE, LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

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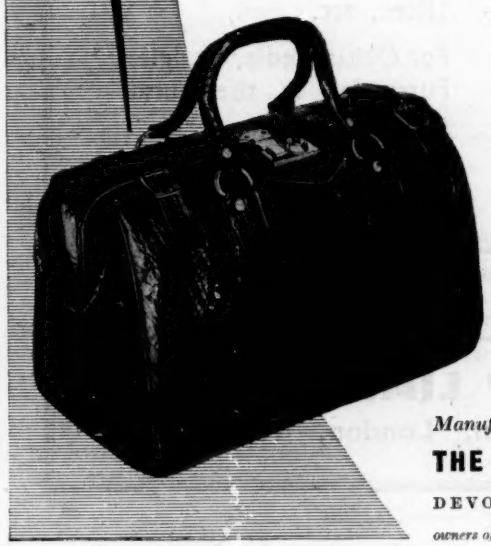

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